

CANADIAN GEOGRAPHICAL JOURNAL

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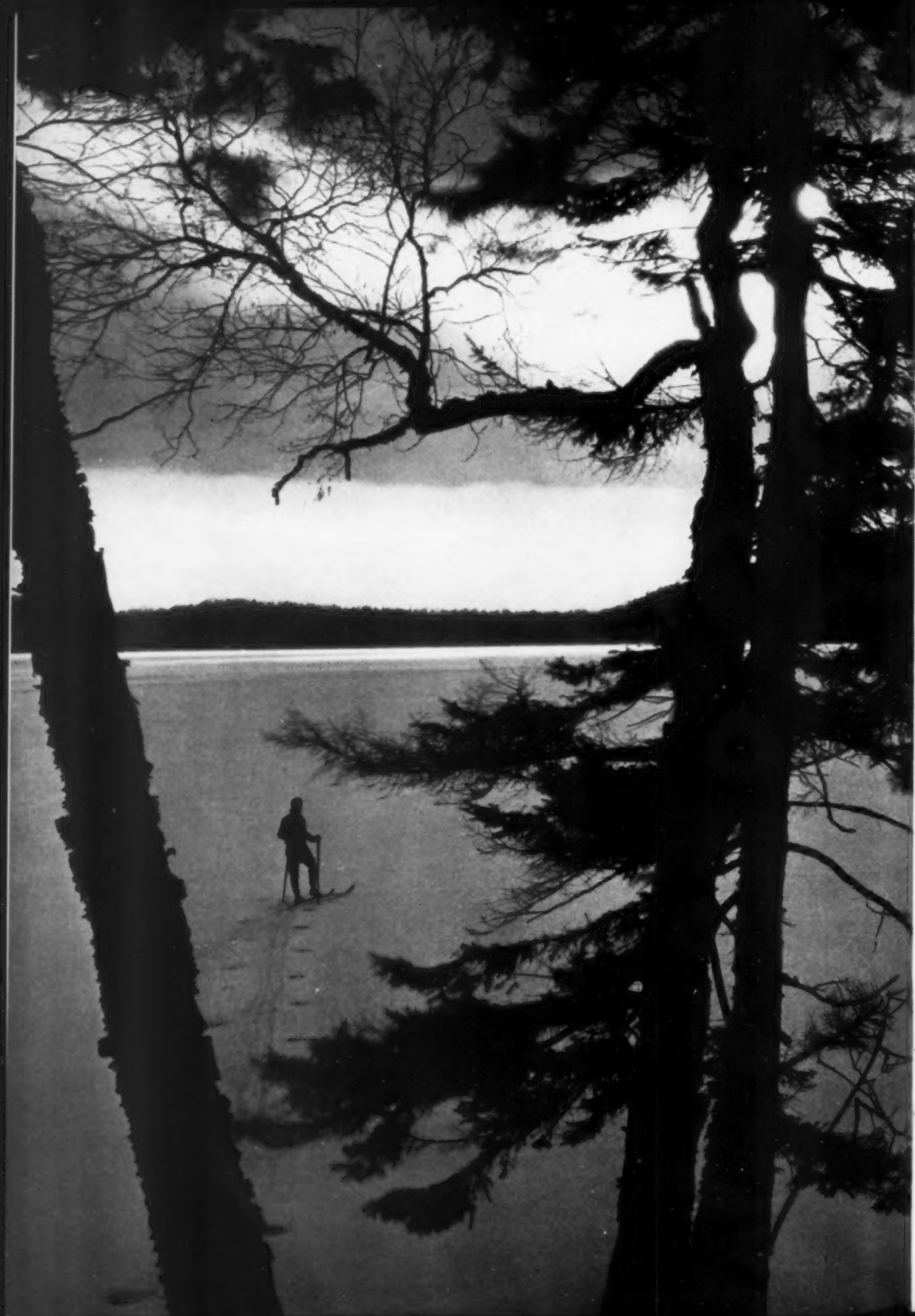
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ANNUAL MEETING

Canadian Geographical Society

The Society will hold its Annual Meeting in the Lecture Hall of the Victoria Museum, Ottawa, on February 17th, 1937 at 8:30 p.m. Dr. Charles Camsell will deliver his Presidential Address, the subject being "Great Bear Lake: An Exploration and its Sequel."

The lecture will be illustrated by lantern slides.



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Gordon M. Dallyn

This magazine is dedicated to the interpretation, in authentic and popular form, with extensive illustration, of geography in its widest sense, first of Canada, then of the rest of the British Commonwealth, and other parts of the world in which Canada has special interest.

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Slipping smoothly through powder snow on Simpson Pass, Banff National Park, a New Year's Day "Sunshine" Ski Camp Scene.
Photo by A. N. Carscallen.

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[NOTE: Volume XIV, No. 1 (pages 1 - 54) replaced by Volume XIII, No. 9 (pages 487 - 540).]

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The British standard of spelling is adopted substantially as used by the Dominion Government and taught in most Canadian schools, the precise authority being the Oxford Dictionary as edited in 1929.

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LEFT:—Winter vista in the "Lake of Bays" district of Ontario, a veritable playground for skiers.

Photo by C.N.R.



"The White Thrill" (Rolleiflex)

Photo by Emil Zeitz.

SKI-ING IN CANADA

by Dudley E. Batchelor, Fred Brewster, Alan N. Carscallen,
H. P. Douglas, Fred A. Hall, A. A. McCoubrey, C. E. Mortureux

SKI-ING in Canada has achieved a measure of popularity that now entitles this sport to be classed as one of the most important factors in the development of her tourist industry. Of prime importance, however, is its contribution towards the establishment of a nation with a better appreciation of the attractive rural regions in which so much happiness and health can be secured. Those familiar with this gift of winter to Canadians and their visitors doubtless have some realization of the facilities prevailing in various sections of the Dominion, but there are many thousands who will welcome the presentation of a clearer picture. For their benefit, an effort has been made by the Canadian Geographical Journal to secure facts and photographs from ski-ing authorities in different sections of the country. It is not possible to cover the whole field in a single issue, so this outline has been limited to those areas in which remarkable progress has been made. In accordance with the present policy of this publication to provide its readers with a pictorial presentation of subjects in which interest is being displayed, particular care has been exercised in the selection from several thousand photographs of those reproduced with this article. Authorities on the various zones recognized by the Canadian Amateur Ski Association who have contributed to this issue are: H. P. Douglas, past president of the association and at present editor of the Canadian Ski Year Book, Montreal and Laurentian district; C. E. Mortureux, president of the Ottawa Ski Club, Gatineau and Seignior Club district; Fred A. Hall, president of the Canadian Amateur Ski Association and former president of the Toronto Ski Club, Toronto and Ontario district, other than Ottawa; Alan N. Carscallen, who has written the section pertaining to the Banff district, and arranged material for the Western Canada section secured from A. A. McCoubrey, Winnipeg area; Fred Brewster, Jasper area; and Dudley E. Batchelor, Vancouver area.

Ski were first introduced to Canada some sixty years ago, in the opinion of H. P. Douglas, who maintains that the honour may be claimed by British

Columbia where, around Rosslands, they were used by miners as a means of transportation during the winter months, though the subject is still open to argument. It has been well established, however, that the foundations of ski-ing in Montreal were laid at least fifty-six years ago, as ski are known to have been in use there as far back as 1881.

MONTREAL AND LAURENTIANS

The Montreal Ski Club, incorporated in 1904, was the first regularly constituted organization of this character to be formed in North America. Started by a few enthusiasts, it has ever exercised a powerful influence on the development of the sport in Eastern Canada. Particular interest has been devoted, ever since the club was opened, to ski-jumping; and its hills—first on the Westmount Mountain, and later at Côte des Neiges—have drawn expert ski jumpers from all over Canada and the United States for the different competitions. The Mount Royal cross-country race, inaugurated during the initial year of the club's operation, is the oldest fixture of this character on the continent.

The Quebec Ski Club was founded in 1908, followed closely by the Shawinigan Falls Ski Club, Three Rivers Ski Club and Sherbrooke Ski Club. Nine years later, in 1917, the Club de Ski Mont-Royal d'Amérique, associated with the Alpine Club of France, was formed. Its members were solely interested in cross-country racing, and did much to popularize the sport among French-Canadians who, up to that time, were concerned primarily in snowshoeing.

In the early Montreal days, ski-ing was confined to our lovely Mount Royal, then a skiers' paradise, with its open slopes, trails and gullies, and the great event of the season was the annual Montreal Ski Club trip to the Laurentians. Without any ski "sticks", we trailed over the high hills, and, as I remember, seemingly with little effort; while to-day the loss of a single stick is a sad tragedy.

Ski-ing was enjoyed by comparatively few men before the war, and ski girls were seldom seen. Ski-jumping was always popular, however, great crowds witnessing

the competitions in which mostly Norwegians and an occasional local lad participated. The war took heavy toll of the Montreal Ski Club members, who enlisted almost to a man at the first call, and sad to say many never came home. During this period, ski-ing practically stopped, but after the Armistice this sport started again with increased interest, and we discovered some of the joys and excitements of our so convenient mountain country. It is amusing to look back, in these days of special trains and excellent accommodation, to those little country hotels where, on our cross-country trips, we would occasionally be forced to spend the night, and to the chilly hours spent aboard or awaiting the snowed-in train. The terrible food, everything fried in grease; the awful coffee and soggy bread, and the beds uncomfortable beyond description; one Quebec heater trying gallantly to warm the entire house and dying completely about four o'clock. But gradually conditions improved; electric lights, bathrooms later on, good beds and proper cooking being provided, so now one can stop over at any of these smaller villages and find all reasonable conveniences. The MacKinnon family played a large part in Montreal's early ski-ing; Tom, Russell, Peter and Frank, all expert ski men and fine sportsmen. Frank in particular was one of the greatest all-round ski men we shall ever see. Famous as a jumper and runner, he won honours for the Montreal Ski Club all over the country and at home. Huntly R. Drummond, now vice-president of the Bank of Montreal, was a great ski man in his day, winning in 1905 one of the first jumping competitions of the Montreal Ski Club. I meet him every winter on ski, still going strong. It certainly is a grand sport to keep one young!

The Laurentian zone of the Canadian Amateur Ski Association, ably directed by Harry Pangman, of the Red Birds, comprises some fifteen active ski clubs. Starting way up at St. Jovite, almost every village has its local ski club, and at all, during the season, local competitions are held. I should like to emphasize that at these local competitions, held throughout the Laurentian zone, the organization is most efficient; competent judges appointed, competitors divided into classes, and A. U. cards required of all. The development of modern technique among these village lads is amazing. Last winter the Quebec Kandahar, blue ribbon event of the Canadian ski world—combined downhill and

slalom—was held at Mont Tremblant, down our longest and stiffest course, and was won by young Viateur Cousineau, only 20 years of age, who beat the record by 1 minute 7 seconds, with Louis Cochand, also from St. Margarets, second. Cousineau did not even have a suitable pair of ski, but ran on a borrowed pair. I saw him come down the last steep pitch of the Kandahar and it was a joy to watch his effortless grace and confidence. Young Cochand, at the recent indoor ski show in Madison Square Garden, New York City, which, by the way, was a truly amazing spectacle, was picked by the judges as one of the most expert of the many competitors gathered there from all over the world. As you ski to-day through any of the little *habitant* Laurentian villages, you see the entire community, young and old, out on ski, and such ski; from barrel staves secured by string, with a five-year-old on top doing the most perfect turns and swings, to elders on boards turned up at the end; all home-made. These youngsters are our future champions, due directly to the formation of such local clubs and the opportunities afforded the country lads, who live on ski, to meet our best in competition. Further proficiency is being stimulated through the initiative of a large department store in Montreal, an expert ski instructress having been brought from Switzerland to provide a series of lessons, theoretical and practical, which culminate with excursions into the Laurentians. Large expenditures have been made during the last three years in improving existing runs and trails, in cutting new ones and in building jumping hills in various centres, so all these clubs have downhill and slalom courses and some good hills. The Province of Quebec has generously contributed, as well as many local sportsmen. In addition, all through the Laurentian zone there are well-marked and conditioned ski trails connecting the ski centres and villages, and one can come across country from St. Jovite to St. Jerome knowing there is a good trail, or rather a choice of trails, all shown on a map, with excellent hotel accommodation en route.

One of the interesting recent developments is the St. John Ambulance Association's first-aid service. With the modern craze for speed and the establishment of many downhill runs came serious accidents. To-day, therefore, at all important ski centres throughout the Laurentians two



*Ski-jumping at
Huntsville, Ontario*

*Just a ski-spill in
the "Lake of Bays"
region of Ontario.*

*Bungalow at
Limberlost Lodge,
Huntsville, Ontario.*

Photos by C.N.R.





Dome Hill, one of the attractions of the Gatineau region that draw hundreds of skiers from the capital city of Ottawa each weekend.

Overlooking the stream named for Nicholas Gatineau, who lost his life in its waters nearly three hundred years ago, this terrain has been widely developed by skiers of Ottawa.

Typical scene in territory that was familiar, until recently, to mosquitoes and black flies in summer, but now popular with Ottawa skiers.

Photos by C.N.R.

experienced first-aid men will be found every Saturday afternoon and Sunday. In their smart uniform, on snowshoes with toboggan and kit, they are ready to render aid in case of injury at major ski meets. Their service is voluntary. The railways furnish transportation, while a fund for their board and equipment is collected from the skiers.

The Laurentians are well patronized throughout the winter. Every liveable house is rented in advance for the season by families, or, as is now so popular, by groups of young people. The Saturday ski "specials" are thronged with many attractive, merry, healthy groups of skiers, some with huge rucksacks containing week-end supplies. In the villages one can easily imagine oneself in some Alpine resort, where "the" street is a colourful mass of humanity, all clad in a wide variety of ski garments. For New Year's, accommodation must be reserved a year ahead. Every bed is taken, and all enjoy a wonderfully healthy existence. Think what all this means to a country that used to go fast asleep on November first and only wake up in the spring! Everyone, railways included, is profiting largely from this greatest of all winter sports. Long may it live and flourish, say we all!

Last winter, the week-end of February twenty-second—an American holiday—we skied into Shawbridge over the hills late in the day, and to our surprise found not even a bed to be had. The reason: A ski special left from the Grand Central Depot, New York, with day coaches on Friday evening, arrived Shawbridge early Saturday, and returned Sunday evening after supper. The return fare was only \$9.60. The railroads are certainly doing their share. Probably the most popular ski centre is St. Sauveur, just over the mountain from Shawbridge. Here the famous Red Birds make their headquarters in their attractive log cabin at the foot of Hill 70. Every house along the village street is a ski shack, rented for the winter. The famous Hill, with a clear drop of some five hundred feet, is literally black with skiers, moving in all directions. Crowds get off the specials, ski at once to the Hill, and stay there all day, going up and down, down and up. And now, to make it even worse, an efficient ski tow has been installed, so all exertion may be eliminated in climbing the Hill. It is quite apparent, therefore,

that ski-ing in and around Montreal is quite a popular pastime.

GATINEAU TERRITORY

Beyond the Ottawa River lies the Gatineau land, a vast tract of rugged territory, which is dotted with numerous lakes and traversed by high ridges or plateaux of granitic formation. Leaping in a long series of cascades, the Gatineau River has cut its way through these ridges for three hundred miles. Named for the first foreigner to ascend the stream, Nicholas Gatineau, fur trader, *coureur des bois* and secretary of the *Compagnie des Cents Associés*, the waters in whose treacherous rapids he lost his life in 1651 have now been tamed by the hand of man, their wild energy having been converted into electrical energy. But, the surrounding country and slopes remain unchanged—*islands of sunset*, as noted by a poet—from their condition in the glacial age, presenting a sharp contrast with the lower lands of Eastern Ontario, across the Ottawa River.

Few people explored those hills until recent years, for the myriads of mosquitoes and black flies that inhabited the region during the summer months, combined with the uneven character of the country, distracted the visitor. When deep snow covered their slopes, only the wood cutters or lumber jacks ventured into the bush. So far as the city was concerned, the Gatineau Valley went to sleep with the first snow, and awakened only in the spring. There were snowshoers, of course, but they seldom paddled far beyond the city limits. The introduction of the ski revealed the tremendous possibilities of this land as a winter resort. There may be gold in other hills, but there is something much brighter than gold in the Gatineau hills—there is pleasure, health and the happiness that goes with it, but the ski disclosed this treasure.

To-day, from early December until mid-April, the hills of the Gatineau, within a twenty-mile radius from the city of Ottawa, are invaded each week-end by a multitude of people, mounted on ski, who leave no slope untried, no trail unexplored before sunset brings to a close another day. By train or by bus, by car or on ski, the whole city goes to the hills. The universality of the sport is perhaps its most striking characteristic. All indulge in



One of many beautiful ski trails at Lake Beauport, near Quebec City.

Photo by C.P.R.

Winter scene on the summit of Mount Royal, where many Montrealers enjoy healthy recreation on ski.

Photo by C.P.R.





Famous "Hill 70" at St. Sauveur, Quebec, where a ski-tow has been established recently to facilitate the ascent of skiers.

Photo by C.N.F.

Typical Laurentian Mountain scene near Shawbridge, Quebec.



it; rich and poor. High-grade, expensive, imported ski share the trail with home-made blades, costing practically nothing. Age is no bar; it is not a sport reserved for the young, and men of 70 are often seen on the trail with 10-year-old youths. Nor is it a passing fad; the ski population is still on the increase after twenty-five years, although much more scattered now than it was at one time. There is a fascination about gliding on the snow which no one can fail to appreciate or escape. It is at once one of the simplest and one of the most difficult of all sports. While a high degree of skill, requiring many weeks of practice, is necessary to tackle the perpendicular slopes at "60 per," the merest novice can enjoy "nosing about" over an undulating, well-sheltered trail, under a blue sky and bright sunshine, without knowing anything of the *gelandesprung*, the *christiania* or the *telemark* swings, and most of those who have once enjoyed that pleasure live on the memory of it, or go on ski-ing to the end of their days.

Ottawa, the capital city of Canada, stands on the threshold of this ski paradise, being only half-an-hour's drive by bus or car from the Camp Fortune range of hills, having a mean elevation of 1200 feet. Here the Ottawa Ski Club has established its headquarters. Hotels are few in this territory, as the close proximity of the city makes them unnecessary, and skiers generally carry lunch in a rucksack. Visitors may make their base at a hotel in the city, coming back from the ski fields at night. There are also splendid ski facilities at Wakefield, further up the Gatineau, where good accommodation can be obtained, and at the Seigniory Club, forty-five miles down the Ottawa River, where ski-ing *de luxe* may be secured. The hills here begin on the golf course, a quarter of a mile distant from the Log Chateau, the club's huge residential building, and a ski school practises on convenient slopes under the guidance of a professional teacher. Further north, connected by a road on which a pleasant drive may be enjoyed behind a horse or team of dogs, is snow-blanketed farm and forest country, strangely beautiful in winter, where the open, rolling character of the Laurentians is particularly well adapted to every variety of ski-running. The Seigniory Club's major ski competitions are held there each winter, and school boy skiers assemble towards the end of

February, when most of the high school students of Montreal, Ottawa, and Hawkesbury compete for honors and a trophy presented by the Seigniory Club for annual competition. The accessibility of the Seigniory Club from Montreal, eighty miles to the east, and from Ottawa, forty-five miles to the west, and the excellence of the train connections through these two points with New York and Boston, Toronto and Detroit, enable most members whose homes are scattered throughout the estate to reach the club in an overnight journey.

Just when the first pair of ski came to Ottawa is not definitely known. It is claimed that a shipment addressed to a Swedish resident, left unclaimed at the customs and sold by auction, was the means of introducing the new "snow skates" to residents of the capital. No book of instructions came with them, however, and the novice skiers were woefully inexpert. For a long time they stuck to the banks of the Rideau Canal, probably because they could not find anything flatter, and when at last they took to the hills they carried a heavy and cumbersome hickory pole, which was used for "braking." A skier who came down a hill without a "spill" was generally congratulated on the strength of his pole. It is probable that the rolling terrain of Sandy Hill, now a residential district, was the scene of their activities in the early '90s. They invaded Rockcliffe Park in timid squads at the beginning of the century. A few years later, Fred Burpee bravely led the first excursion to the hills of East Templeton, across the Ottawa River, while William Stewart inaugurated the trips over the long bush trail from Kirk's Ferry to Ottawa. About 1909, several young Norwegians, the Lockeberg brothers and the Kihl brothers, made their appearance in Rockcliffe Park, and caused a sensation by the skilful handling of their blades. They built a small jump and things began to hum. The Ottawa Ski Club was born of this first structure in 1910, Sigurd Lockeberg being the premier president. The new club engaged entirely in jumping; and under J. A. D. Holbrook, the second president, a tower was erected. This was enlarged from year to year until it reached a rather dangerous height. Came a hurricane, which wiped out the assets of the new club in 1914, and a call to arms, to which skiers nobly responded.

In 1919, the Ottawa Ski Club was reorganized with the writer as president. About this time, the Cliffside Ski Club was born, and "Ted" Devlin elected president. The keen rivalry and, later, the friendly co-operation between these two clubs resulted in the country being opened up, and in the swift popularity of the sport. The initial city championship race was held by the Ottawa Ski Club on the heights at Kingsmere in 1919, and the first champion was George Audette. Perhaps, also, the first definite steps taken to encourage cross-country ski-ing were made by the same club which, in the winter of 1919-20, secured a wood cutter's shack "somewhere in the hills back of Kingsmere" and advertised it as a stop-over lodge on the Kirk's Ferry trail. It was indicated that skiers would be met at the train and conducted to the new lodge. The response was stupendous. Deserting the slopes of Rockliffe, over seventy-five skiers answered the call, and filled the small shack and the knoll on which it stood to overflowing. Fortunately the day was mild. In preparation for its visitors, the club had spent the sum of one dollar for building paper to line the inside of the "lodge." It was the first of some thirty thousand dollars to be spent by this club during the next twenty years in its construction of lodges and ski towers, the opening of trails and the purchase of land, while the Cliffside Ski Club followed suit by building camps at Keogan's Clearing, Pink Lake and Fairy Lake. The Ottawa Ski Club now owns four lodges scattered over fifteen miles of territory, some of which can accommodate over four hundred persons—the Western Lodge, the Camp Fortune Lodge, the Pink Lake Lodge and the Dome Hill Lodge. It is also the proud possessor of over 400 acres of wooded land at Camp Fortune, and of one of the highest ski towers in North America at Rockliffe Park, built in co-operation with the Cliffside Ski Club. Its membership, reduced by the depression, but now again on the increase, once totalled 2,350.

In addition to the building of lodges, two initiatives stand out among the many that have helped to foster ski-ing in Ottawa. First is noted the training of the young by Mrs. F. G. Semple, who for ten long years led a number of "tots" from 7 to 12 years of age over the Dome Hill trail every Saturday and taught them the rudiments of this sport. At times the number of her

wards reached 85, necessitating a dozen assistants. Many in Ottawa who now enjoy ski-ing owe it to Mrs. Semple's untiring efforts. The second of these initiatives is the creation of a magnificent series of trails by Captain T. J. Morin, the first secretary of the club, and a ski-jumper who finally was converted to cross-country ski-ing. The Canyon Trail, the Highland, Little Switzerland, the Merry-Go-Round, the Western Trail and the slalom hill will remain as an everlasting monument to that master trail-builder. Many Dominion and other championships were held and won over these trails. While some of them follow abandoned forest roads, the majority were cut out of thick bush at considerable expense. There are few open hills anywhere in the Gatineau district, and practically every slope has had to be cleared. Bush trail ski-ing is rather difficult and demands the development of a special technique, but it affords shelter from the wind; quite an advantage in a country where sub-zero temperatures generally prevail in winter.

By carrying the sport further afield to the high hills, the Ottawa Ski Club has also greatly lengthened the season. There is still snow on the heights of Camp Fortune when the slopes nearer the city are bare, and ski-ing goes on merrily until April 15th, instead of stopping around March 1st, as in the past. So long as there is snow in the bush, all's well!

TORONTO AND ONTARIO HIGHLANDS

The secret behind the tremendous popularity of ski-ing in Ontario is organization. Ontarians have no mountains, as the Alpine skier knows them. They have no forty-foot snowfalls in a season, as do skiers of the Rockies, but they have an overwhelming desire to ski, and they have employed every possible artifice to make ski-ing an attractive sport, tempting the prospective beginner and providing enough variety to sustain his interest year after year.

In Toronto alone, organization has been responsible for building up a club membership which may possibly exceed three thousand this season, and is believed to be a record for any local ski club in the world. These members could ski on any number of open hills near Toronto, but they prefer the terrain at Summit, where an army of them has been busily



*Ski trail through
Gatineau territory.*



*McLean's Moun-
tain Lodge, Kings-
mere, Quebec.*



*Looking down the
Gatineau Valley
from Kingsmere.*

Photos by
Paul Horsdal, Ottawa

*Ottawa Ski Club
trail*

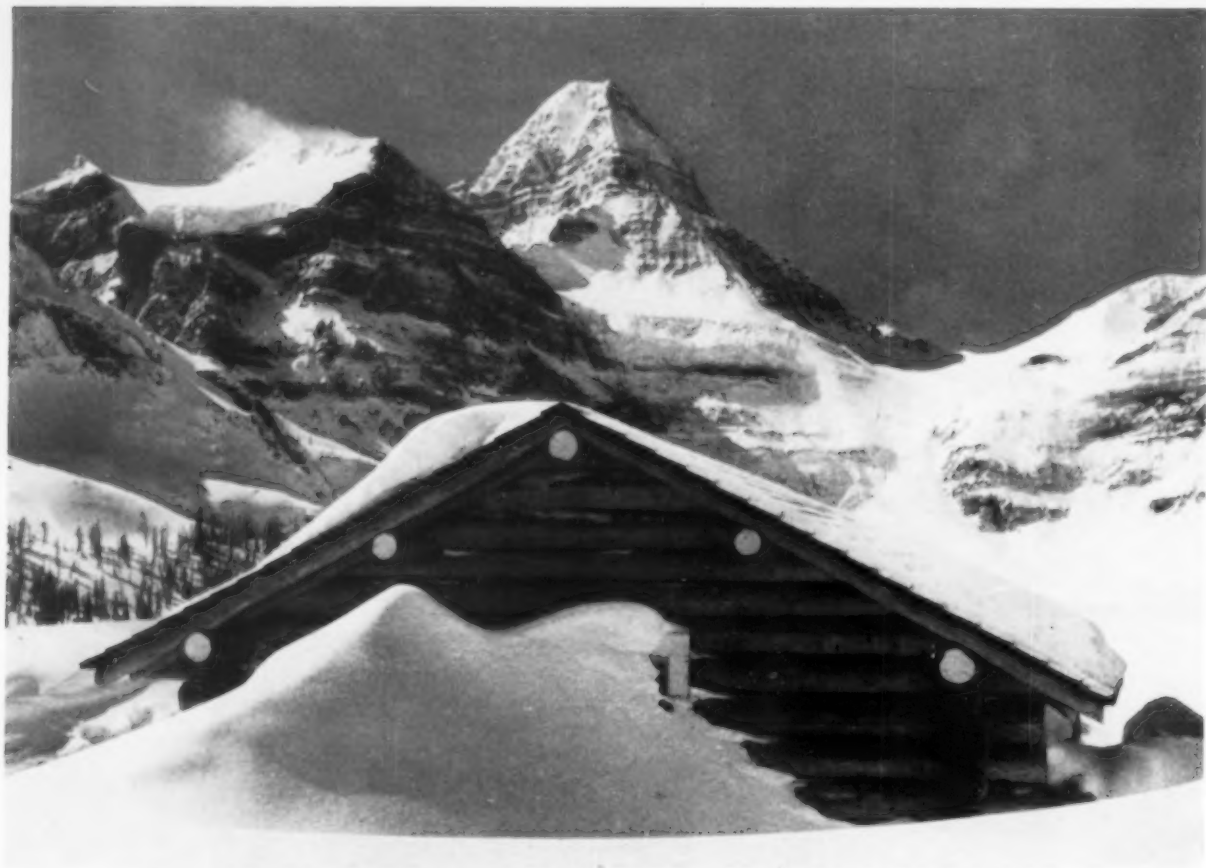


*On the "Highland"
trail of the Ottawa
Ski Club.*

*The village of Old
Chelsea, jumping off
place for skiers in
the Gatineau Hills.*

Photos by
Paul Horsdal, Ottawa





Ski camp in the Rockies, Mount Assiniboine in the background.

Photo by Lloyd Harmon

Ski country at La Rivière, Manitoba.

Photo by Nicholas Moraut



engaged for the past decade transforming rolling country into an ideal locality for ski-ing as a means of recreation. The greatest hill on the property is not more than one hundred feet high, and yet we have heard skiers from eight-thousand-foot mountains say they never enjoy ski-ing as much as they do at Summit. Gay crowds in the ski lodges, fascinating trail running, throngs of beginners, and experts too, practising manoeuvres ceaselessly on the nursery slopes; families, with children and grandparents, frisking around in wild excitement or gliding leisurely over the easy trails as their age dictates; the smell of burning wax, coffee and beans blending with the aroma of a wood fire at the end of the day; all these go to make up the lure of ski-ing to the average person.

Scenic trails twist and turn through the bush, where the cold wind is stilled by a generous growth of evergreens laden with snow. These trails are planned and cut out for a definite purpose; some with steep, fast runs, interspersed with sharp turns for the more expert; while others are gradual slopes with wide bends for the novice. All are plainly marked with signs, and each member is provided with a map showing all trails on the property.

Competent instructors, both professional and amateur, are always on hand to impart their knowledge to the beginner. Gymnasium classes are also available for those wishing to get in good physical condition before the ski-ing season starts. Beginners are first taught the meaning of control, so they may ski safely. Next, they are coached in various advanced manoeuvres. Proficiency tests have been devised to raise the standard of technique. For the more vigorous, facilities are provided for four main branches of competitive sport, namely ski-jumping, cross-country, downhill and slalom racing. All four branches have their own particular appeal, but encouragement is given to each.

Standard jumping hills have been constructed of various sizes, from small practice jumps to the big hill at Thorncliffe, where the Dominion championship was held last year. Downhill race courses have also been constructed at the Caledon Mountain, where seemingly impossible rocky precipices have been blasted and smoothed out to form high-speed tracks, and also at other centres, such as Orangeville and Flesherton. Cross-country race courses have been surveyed for ideal routes,

and suitable hills for slalom courses have been cleared of brush and other obstacles.

From the nucleus of enthusiasts in Toronto, the Ontario Zone Committee was formed and, by their experience as members, committee chairmen, directors or presidents of the Toronto Ski Club, they assumed responsibility for uniting all the ski clubs in Ontario, excepting those in the Ottawa district. In turn they visited or contacted such places as North Bay, where the Ontario Provincial Tournament will be held this year; Huntsville, since a town of many snow carnivals; Peterboro, now wildly ski-minded; Port Carling, Bracebridge, Midland, Penetang, Orillia, Barrie, Kitchener, Hamilton, Bobcaygeon, Lindsay, Collingwood, Port Arthur, Fort William, Renfrew, Burke's Falls, Walkerton, Limberlost, Uxbridge, Timmins, St. Catharines, Kirkland Lake, London, Belleville, Cannington, Owen Sound and many other towns in the province—about fifty in all—where active clubs are gathering impetus.

Although handicapped by lack of funds, the zone committee, with H. T. "Sam" Cliff as chairman, undertakes to visit as many of these clubs as possible to lend them encouragement and build up enthusiasm. Through voluntary contributions, ski-ing films have been purchased or donated, instructors sent out, plans for jumping hills designed, informative bulletins distributed and other services rendered. Cent-a-mile excursions are arranged, and "ski specials" leave Toronto each Friday night during the season, weather conditions being favorable, for Huntsville and other "resorts." Although ski-ing in the Ontario highlands is still in its infancy, more than a thousand persons patronize these trains.

A tremendous winter tourist business has been developed through the pioneer work of the zone committee, and the otherwise dull and monotonous trend of winter life in outlying districts is brightened every week-end by hosts of skiers who travel by snow trains, busses, motor cars and even aircraft to exchange the hectic rush and bustle of city life for the great winter outdoors.

SKI-ING IN MANITOBA

Sixty miles southwest of Winnipeg are the uplands of the Manitoba escarpment, rising steeply to 500 feet above the Winnipeg plains. These are now being

exploited by the downhill runner and, thanks to the co-operation of the railway companies, are readily accessible from Winnipeg. Ravines at the sharply-marked edge of the uplands, as at Miami, furnish the ski country, and a huge valley in the heart of the terrain, excavated by the post-glacial stream flowing from Lake Souris at the close of the Ice Age, furnishes the ski playground of La Rivière.

Organized ski-ing in Manitoba goes back twenty-four years, when the Winnipeg Ski Club was formed. In common with ski-ing in other parts of Canada in those days, more attention was paid to jumping than downhill running. Indeed, the only downhill running possible near Winnipeg was on the banks of the shallow, trench-like valleys of the Assiniboine and Red Rivers, which meander through the Winnipeg plains, twenty to thirty feet below the general plain level. About eight or nine years ago, a number of Winnipeggers learned to appreciate the suitability of Minnedosa, 135 miles to the northwest, for this form of sport. Other sections of the province were known to be satisfactory, but Minnedosa was the only one served by rail, thus permitting of week-end trips.

With the building of trunk roads throughout Manitoba, Winnipeg skiers rapidly became aware of the possibilities nearby. The fact that these roads were usually open during a December snowfall made it possible actually to try out the terrain on ski, and the result of extended investigations indicated that the most suitable place within reach of Winnipeg for one-day excursions was La Rivière. This little town, 114 miles southwest of that city, lies in the deep valley of the Pembina River at the junction of Mary Jane Creek. A club was formed two years ago to undertake the development of the area, and the first ski train in Manitoba was operated from Winnipeg to La Rivière in February, 1935. The success of this venture called for a second, which ran the following month, and during the past summer, under the capable direction of its hard-working president, Les Speechly, the Snowbirds Ski Club directed the clearing of additional trails and ski runs, which are now sufficient to provide recreation for a multitude of skiers. The success of La Rivière stimulated the enterprising little town of Miami, situated 20 miles northeast of La Rivière, to open up trails in a ravine on the very edge of the Manitoba

escarpment. Special ski trains were run last winter, and both towns now have a regular "ski-special" schedule during winter week-ends.

On account of the comparatively light snowfall in the Winnipeg area, the length of the ski-ing season varies greatly. One may usually depend on nine weeks' of continuous sport; from the first of January to the first of March. On the other hand, a heavy snowfall in late November or early December may lengthen the season by four or five weeks. The total snowfall varies greatly from winter to winter, but usually runs between forty and fifty inches. There are other and more distant areas in Manitoba suitable for downhill running, some of these, such as the Brandon hills, now being examined, and there is a fruitful field for investigation on the slopes of Turtle Mountain, in the south; and on Riding and Duck Mountains, in the north. The Manitoba skier may thus enjoy not only the pleasure of ski-ing in developed territory, but the still greater joy of the pioneer in seeking slopes as yet unmarked by ski tracks.

ROCKY MOUNTAIN REGION

Ski-ing is not a new sport in the West. True, it has enjoyed and thrived on that enormous wave of interest that has characterized the sport in all countries during the last few years. Many an old-timer remembers the early days of ski clubs at Camrose and Edmonton, Alberta, and Revelstoke, British Columbia. Few of these veterans could have visualized, however, the sudden and rapid increase in popularity that was to come when the mother and father of the ski family — jumping and cross-country — were to be blessed with two rollicking youngsters — slalom and downhill.

Banff, having an altitude of 4500 feet and a very mild winter climate, is well-known as a resort, and the centre of ski-ing activity in the Rockies by reason of its familiarity to the largest number of ski visitors from near and far.

So temperate is the weather at times that the warm breath of chinook winds not infrequently leaves the ground bare of snow. This condition changes very rapidly, however, as altitude is gained. Accordingly, the Mount Norquay Ski Camp, which is eleven hundred feet higher than the town,

and distant only three and a half miles by motor road, enjoys a snowfall of from three to six feet. The Norquay slopes, facing east, are better shielded from the caress of the chinooks than is the town itself.

The skiable part of this east side of Mount Norquay extends from camp level at 5600 feet to precipitous rock at about 7600 feet. The lower part of this slope has been cleared to provide practice grounds and give access to the higher reaches, which are free from trees. These higher slopes are used for the staging of downhill and slalom races. The former, which is over a mile in length, was negotiated by Ted Paris, of Banff, last winter in the record time of one minute and thirty-five seconds.

Norquay is visited each week-end by upwards of one hundred Calgary skiers. With Banff enthusiasts, they are this winter entertaining at Norquay fellow devotees from all over the North American Continent at the Dominion Ski Championships, being held for the first time on mountain terrain.

An excellent new jump has been built at Norquay by the National parks' branch of the Department of Mines and Resources, and it is expected that competitors will make distances of two hundred and fifty feet. The eighteen-kilometre cross-country course finishes at the camp after covering a great variety of country. Although the slalom course will have a descent of seven to eight hundred feet, it will probably be overshadowed in the minds of those unfamiliar with mountain ski-ing by a downhill course of nearly three thousand vertical feet in a mile and a half.

European ski-ing is definitely superior to the sport on this continent. One factor responsible for that pre-eminence is practice and competition on the high mountains of the Alps. It is to be hoped, then, that these first Dominion Ski Championships in the Rockies will popularize this territory, and provide an appreciation of its advantages among Canadian skiers, who may eventually secure the necessary experience to capture some of the major downhill and slalom titles in Europe.

Mount Norquay is the haven of local skiers, and on week-ends it is visited by hosts of gay excursionists from Calgary. For those who have more time for the sport, it represents but one of the three types of ski-ing for which Banff is the centre; classified

according to altitude as low-country ski-ing, below timberline; high-country ski-ing, on the slopes and mountain sides adjacent to the timberline ski camps; and ski-mountaineering, in the "sub-stratosphere" of the high-country. The last characterised by glacier ski-ing, difficult traverses on very steep ground, and the infrequent necessity of removing ski to climb up a short rock cliff or cross outcropping shoulders. The *raison d'être* of most ski-mountaineering is the actual ascent of a peak.

In that classified as high-country ski-ing, we meet what is possibly the most interesting feature of this sport in the Rockies, namely the comfort and ease with which one can enjoy the very finest of ski-ing in surroundings that are beautiful beyond description.

There are three developed, high-country ski areas, which boast establishments that for want of a better name are called camps. All the cabins are constructed of logs, and range in size from small private shacks to beautiful main lodges, one of which has a lounge fifty-six by twenty-five feet — cheered by the crackling of logs in an enormous stone fireplace. Electric light, modern plumbing and large leather chesterfields are luxuries that one is surprised to find in these camps, which are accessible only by pack horse in summer and ski in winter.

These camps are located at Mount Assiniboine, about thirty miles south of Banff; in the "Sunshine" district, fifteen miles southwest of Banff; and in the Skoki Valley, ten miles north of Lake Louise. All are situated at seven thousand feet, which is as high as cabins may be built in that part of the Rockies, for timber grows very little higher. Great areas of rolling open country are adjacent to the camps, and ski-ing of almost any conceivable type may be found. Downhill runs of a mile in length and one thousand vertical feet are numerous. The Assiniboine Camp claims ten runs in the neighbourhood of three thousand vertical feet. One of the most pleasing features of the Sunshine district is the fact that whenever you are within a mile of camp you can point your ski downhill and go skimming right to the front door of the main lodge. For those who crave long runs, Skoki offers accessibility to the Drummond Glacier, and from either of the two peaks of Mount Drummond runs of four thousand vertical



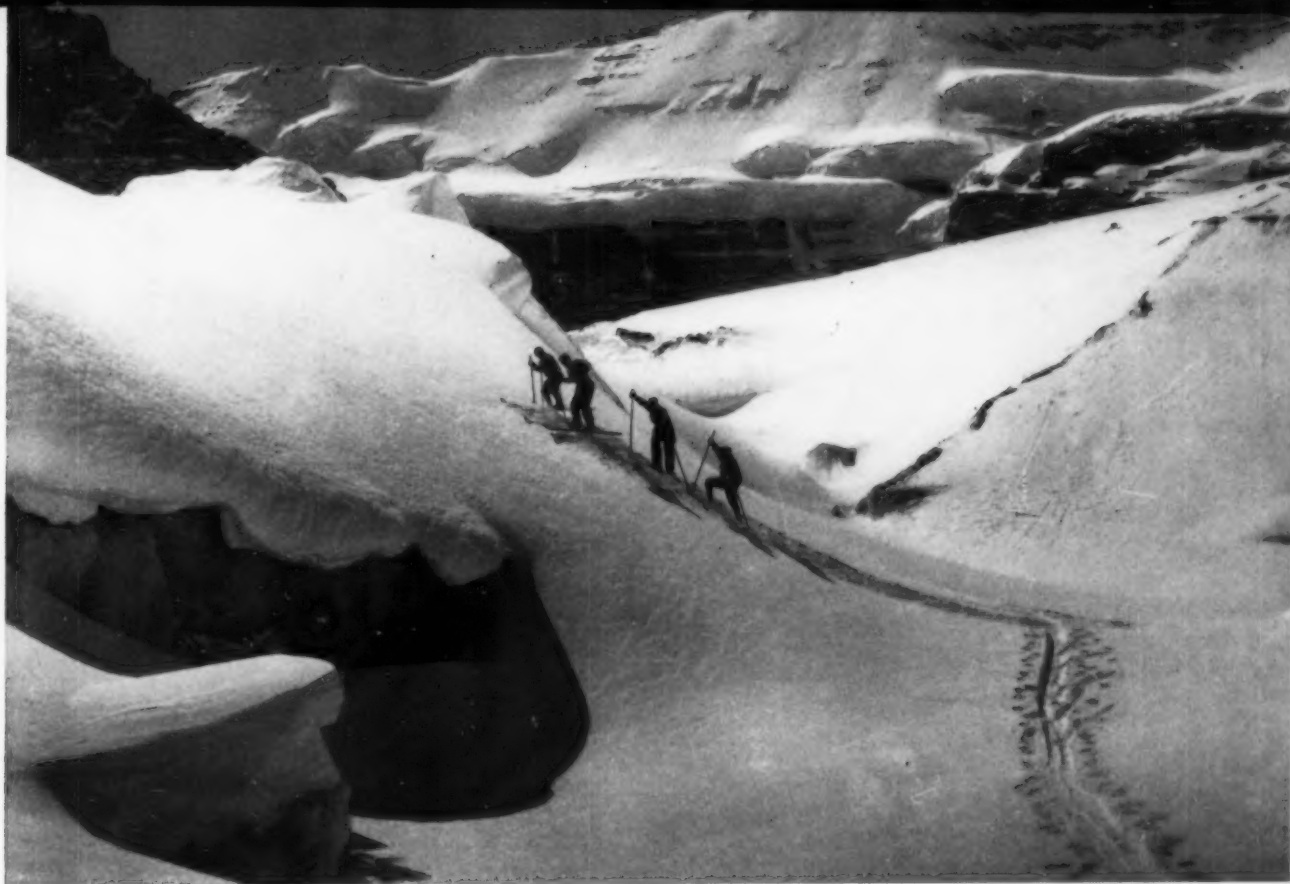
Sun-bathed ski slopes above the Skoki Halfway Camp, near Banff, Alberta.

Photo by B. G. Moodie

High-speed turn in powder snow at Sunshine Camp, near Banff, Alberta.

Photo by A. N. Carscallen





Among the crevasses near Mount Victoria, Banff National Park, Alberta.

Practising "christies" by dodging cornices in the Ptarmigan Valley, Alberta. Photo by B. G. Moodie







ABOVE—While twenty feet of snow may cover the slopes of Grouse Mountain, a skiers' paradise, golfing continues in Vancouver, below, and on Vancouver Island, outlined 'neath the setting sun.

Photo by Lloyd Harmon, Banff
Photo by A. C. Phillips, Vancouver

feet in distances of six and eight miles. These then are but a few random comments on the wonderful ski-ing that may be found in the high-country.

The skiers who visit these camps come from near and far, Calgary and Vancouver being the best represented of Canadian cities, but from the Eastern States, the Middle West and even Mexico City skiers join with devotees from the Alps to glory in the untrammelled slopes of powder snow that greet them in the Rockies.

Last and possibly most spectacular of the three types of ski-ing in the Rockies is ski-mountaineering. Trips of this nature have been comparatively few. It is interesting to note that possibly one-half the mountaineering to date has been done by skiers from the continent of Europe, some of whom have brought Alpine guides with them. The three major ascents along the main chain of the Rockies have been Mount Edith Cavell, near Jasper; the Snow Dome, crowning the Columbia Icefield; and Mount Balfour, in the Waputik group, just a few miles northeast of Lake Louise.

Midway between Lake Louise and Jasper lies the Columbia Icefield. One hundred and fifty square miles of perpetual ice blankets hills and valleys that vary in altitude from the summit of Mount Columbia (12,244 feet) to the snouts of the Columbia, Athabaska, and Saskatchewan Glaciers, the lowest of which is 5000 feet. On two or three occasions, small parties from Banff and Jasper have skied the seventy miles or so to visit this country in winter. Although the Jasper-Lake Louise road, now under construction, will pass close to the end of the Athabaska Glacier, which pours down from the icefield, the road will not be open for traffic in winter. Ski from the road, up the Athabaska Glacier and thence to the summit of Snow Dome (11,340 feet), and you would be looking down on the most awe-inspiring scenery in the Rockies! The Snow Dome is the hydrographic apex of Canada, for water from the slopes of this one peak flows down to Hudson Bay, the Arctic, and the Pacific. The run back to the road is a skier's dream. In six miles of ski-ing one loses more than a mile in altitude.

The Athabasca River, having as its source the Columbia Icefield, flows north and northeast through the Rockies for some ninety miles, before leaving the

mountains at Brule Lake. The short, steep, lateral streams, which join the main river, have, at their sources, areas of open summit country, which vary in extent from two to ten square miles, and in altitude from six to ten thousand feet above sea level. On these highlands, snow lies for seven months of the year, with frequent fresh falls from November until May.

Jasper, situated in the main valley of the Athabasca, and well within the mountains, forms a satisfactory base from which to reach these ski-ing areas. A motor highway traverses the entire length of the valley, facilitating the approach to the junction of the particular lateral to be ascended.

In three of these areas, namely the Tonquin Valley, Columbia Icefield and Maligne Lake, investigation of slopes and runs has been carried out during the course of the past eight winters, while at the same time snow conditions have been closely observed by reliable skiers, with the following general summary of opinions:—

The Tonquin area, with an approximate base level of 6500 feet elevation, reaching on the Penstock and Eremite Glaciers a height of some 9000 feet, maintains a depth of snow varying from three to ten feet, and offers a great number of shorter runs from one-half mile to a mile, while on the above named glaciers there are runs of from two to three miles in length. In the southeasterly end of the field, namely the Eremite Glacier portion, the snow conditions have not as yet been carefully observed throughout the season.

In the Maligne Lake area, a rather fortunate geological formation—a double row of peaks forming the one mountain range—provides a series of high and connecting basins. These enjoy a northeasterly exposure, with the main high ridge of the range to the west and southwest, which acts as a protection from the high winds of winter. In the vicinity of Maligne Lake, good glacier runs have been established, and a considerable area, at the upper end of the lake, remains to be investigated.

Development of facilities for skiers going into these areas has definitely begun. At Maligne Lake, due perhaps to its present accessibility and to its wide extent, there is already suitable accommodation for some twenty people, and during the summer of 1936 the first ski hut was completed and provisioned in the higher

slopes. It is now proposed to continue with the establishment of these huts at strategic locations in the higher basins, in order that movement from one area to the next throughout the entire length of the Maligne Range may be made in comfort, and the whole time spent in the higher and better ski grounds without the necessity of descent into the main Maligne Valley.

VANCOUVER SKI-ING GOOD

Vancouver is the centre of ski-ing in the far west, as it contains by far the greatest number of skiers, and there are numerous clubs whose activities mainly take place on either of the three mountain ski terrains available, namely the Hollyburn Ridge, Grouse Mountain, or in the Seymour Range.

The ski-ing season in Vancouver usually commences early in December and lasts until the end of May. This at first seems rather strange for a city at sea-level, but when one considers that the ski-ing territory lies at an altitude of between three and five thousand feet, and that there is heavy precipitation on the west coast, it is reconcilable. The depth of snow varies from 12 feet and more around the cabins to 40 feet at the peaks.

The Grouse Mountain ski terrain is situated on the mountain of that name, about one hour by motor from the centre of the city, at an altitude of 4000 feet. The beautiful chalet at the top of the road is the point of assembly for all skiers in this area, and commands a magnificent view of the city, especially at night. Some of the skiers have private lodges, while each club has its own cabin, operated by the members on a co-operative basis. There are well-equipped kitchens and each person brings up his own food for the duration of his stay. Those members desiring to spend week-ends at the camp may rent

bunk space for the season at a nominal charge.

The first slalom race ever held in British Columbia was run at Grouse Mountain during the season of 1931-32, and since then the "Grouzers" have more or less specialized in downhill and slalom racing. The courses have been steadily improved and extended, until they now test the ability of the most expert racer. Because of the week-end camaraderie of the members, an excellent club spirit is evident in each of the groups, whose members live together like big happy families.

Hollyburn Ridge is distant about two and a half hours from the centre of Vancouver, and the camp is at an altitude of 3000 feet, the ski-ing slopes going as high as 5000 feet. There is also a main lodge here, but more of the skiers have private cabins scattered among the trees. After a dance in the lodge, it is a pretty sight to see the lights carried by the skiers flickering among the trees like glow worms, as they wend their way home.

The terrain naturally lends itself to splendid slalom and downhill racing, but championship jumps and langlauf courses have been laid out. Hollyburn was the site of the "B.C." four-event championships last year; possibly the largest and best tournament ever held at Vancouver.

Although Kipling was much impressed with his observations of Canada, and charmed by the beauty of her winter blanket, some annoyance was occasioned by his reference to this Dominion as "Our Lady of the Snows." It was maintained that many people would be discouraged from coming to this country by wide circulation of such a descriptive title. Now, however, Canadians are learning to appreciate the glories of their winter heritage, the stimulating splendours of silence, of snow-jewelled hills and of ice, where her white mantle supplies health and happiness for thousands.







Sample of ski-ing grounds at the Hollyburn Ski Camp, north of Vancouver.

Photo by A. C. Phillips, Vancouver



Mountain grandeur and scintillating snow fields above Maligne Lake, Jasper National Park, Alberta.

Photo by C.N.R.



Downhill runs of a mile and more provide descents of 1000 vertical feet to the very door of Sunshine Ski Camp, Banff National Park, Alberta.



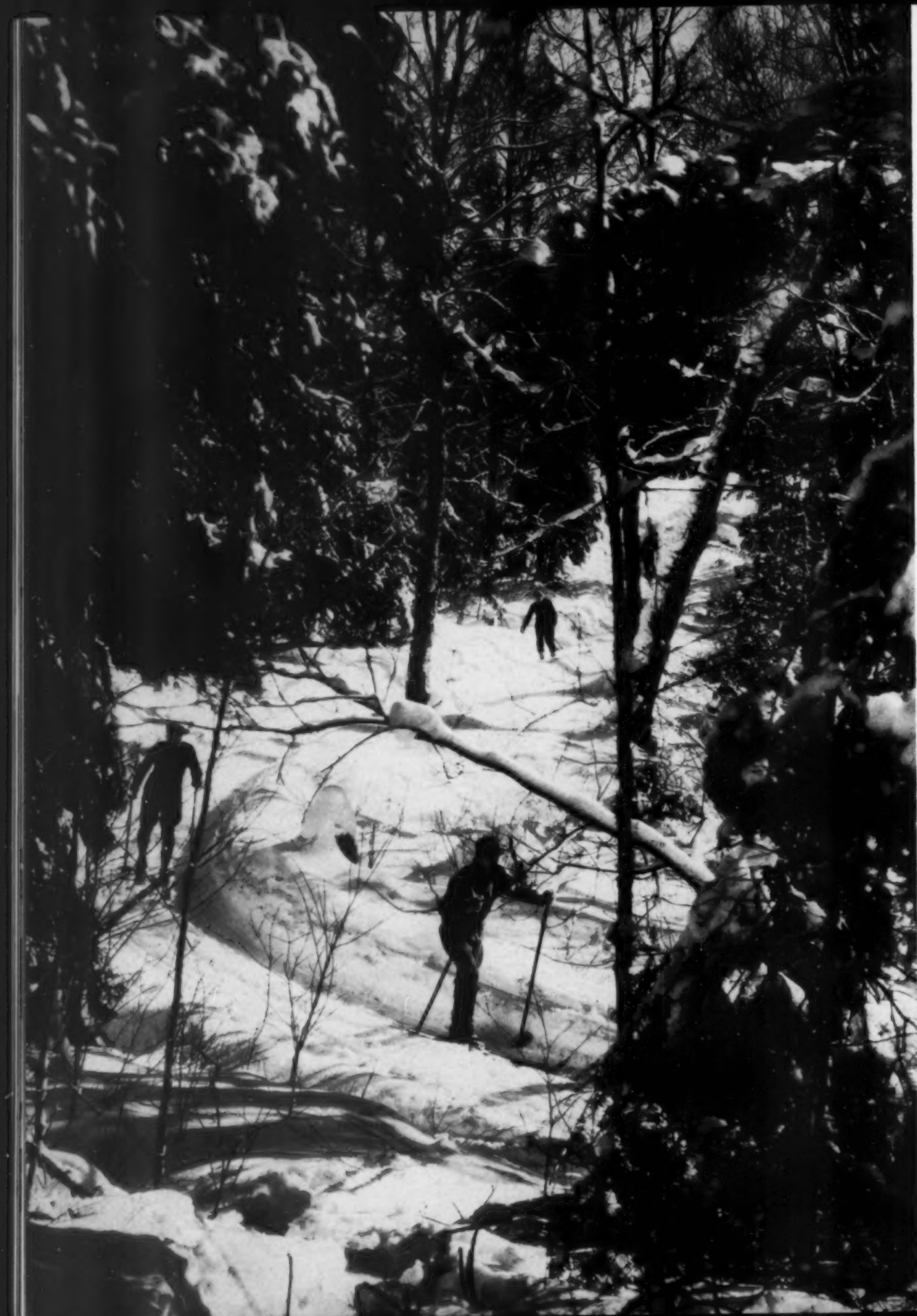
Free fast ski running.



Unobstructed ski terrain on Deception Pass, with Mount Shoki behind. Banff National Park, Alberta.
BELOW:—Herringbone pattern on the Seignior Club slopes, midway between Montreal and Ottawa, on the north bank of the Ottawa River.

BELOW:—Herringbone pattern on the Seigniory Club slopes, midway between Montreal and Ottawa, on the north bank of the Ottawa River.







LEFT:—One of many ski trails in the "Lake of Bays" district of Ontario.

Photo by C.N.R.

Refreshment and reflections near Limberlost Lodge, Huntsville, Ontario.

Photo by C.N.R.



WITH THE PEARLERS OF NORTHERN AUSTRALIA

by EWEN K. PATTERSON

THE extensive pearl fishery of Northern Australia was the fourth to be discovered of the great pearl fisheries of the world. The first, which was known in classic times and which is still one of the greatest sources of pearls, lies in the Indian Ocean, in the Persian Gulf, and round the shores of Ceylon; the second is in the Gulf of California, and was originally worked by the Aztecs of Mexico, and later by their Spanish conquerors in the seventh century; the third is in the centre of the Pacific Ocean, in the coral seas round the Society Islands. This was discovered during the nineteenth century, a few years before the first pearls were discovered in the seas of Northern Australia in 1868.

The pearl fishery of Northern Australia is the largest in the world, and extends from the northern end of the Great Barrier Reef, in Torres Strait, westward to the waters that wash the northwestern coast of Western Australia. Since 1868 this fishery has supplied the world with more than three-quarters of its supply of pearls and pearl-shell. Year in and year out a small army of divers — including dress divers of almost every nationality, and native "skin-divers" (natives who use no diving dress) — is engaged in these tropical waters, walking the floor of the seas and gathering up the big gnarled shells, which may or may not contain pearls of price.

Hundreds of pearling luggers, of from five tons to twenty tons burthen, are employed in the industry, which has been worth an average of approximately half a million pounds annually since its establishment. Shark Bay and Broome, Western Australia; Darwin, Northern Territory; and Thursday Island, North Queensland, are the home ports of the

pearling fleets. At each of these isolated outposts of white civilization, gem merchants of all the leading countries in the world have their representatives, who attend the regular pearl sales. Manufacturing firms of Great Britain, Europe, America and Japan also have buyers stationed at these ports to purchase the pearl oyster shells, which are used in the manufacture of mother-o'-pearl buttons, knife handles, etc.

Shark Bay is one of Australia's strangest ports, being noted for its pearl-paved streets. These have been top-dressed with old pearl oyster shells, and they glint like opal in the sun. Many of the houses at the port are also decorated with the shells. Broome, Darwin, and Thursday Island, picturesque towns with cosmopolitan communities including Britishers (Australians and other whites), Asiatics (chiefly Japanese, Chinese and Malays), Europeans (chiefly Germans, Italians, Greeks and Maltese), South Sea Islanders, Papuans, and civilized Australian aborigines, most of whom are connected with the pearling industry.

These towns are noted for their wide, grassy and palm-fringed streets. Swaying coconut palms grow in abundance everywhere, while tropical fruits, such as bananas, pawpaws, pineapples and custard apples flourish in backyard gardens.

When the pearling fleets come in, the ports spring to life. The warehouses of the different buyers prepare for the shell sales, while business houses bustle around with food supplies for the luggers to take on their next trip to sea. Often the boats are at sea for weeks, and even months, at a time, the divers descending every day. A boat rarely comes into port unless she has a full load of shell, and, consequently, large quantities of food have to be carried on board.

Left:

A gold—or silver-lip oyster shell (*Pinctada maxima*) containing a "blister" pearl. A "blister" pearl is really only half a pearl, and when used in jewellery it has to be mounted so that the back cannot be seen. Such pearls are formed by the oyster when some parasitic worm or insect attempts to burrow through from the outside of the shell. To keep the intruder out the oyster builds a thicker and thicker wall of "nacre" or mother-o'-pearl, and thus a lump or "blister" pearl is formed. On occasions tiny, perfectly round pearls of high value have been found inside these "blister" pearls.



A pearling boat in full sail. These vessels, called luggers, are also equipped with a small engine for use when the wind drops. The crew usually consists of four divers (two dress and two natives), one pump tender, one engineer, and one cook. The pumps, which are operated by motors, have pipes leading over both sides of the boat, so that two dress divers can, if necessary, work at the same time. The native divers usually dive from dinghies, two of which are being towed by the boat shown in the picture.

Typical North Australian coastline.



The pearlers do not go out simply and solely in search of pearls. If these valuable gems are discovered they constitute a stroke of luck. What the pearler seeks is pearl shell — mother-o'-pearl — which is sold at so much a ton. If a pearler obtains a really valuable pearl in every twenty tons of shell he considers himself very fortunate. But still, some pearlers are extremely lucky; many have retired with small fortunes after a few years. One, for instance, received £14,000 for a single pearl. This was the famous "Star of the West" pearl, a gem weighing one hundred grams, about the size of a sparrow's egg — the largest and finest individual pearl yet found in Australian seas. The most valuable pearl discovery ever made in these waters was "The Southern Cross", a collection of nine pearls all naturally fastened together in the shape of a cross. This cross was sold for an immense sum, stated to be in the vicinity of £50,000, and it is now in the Vatican City, Rome.

There are three species of pearl oysters found in the waters of Northern Australia, the most plentiful of these being the Gold- or Silver-lip oyster (*Pinctada maxima*). This is the largest oyster known to exist on the globe. It grows to an average size of about twelve inches in diameter, and an average weight of about ten pounds. The shell of this oyster is the most valuable pearl-shell found, and it brings as much as £350 per ton on the market. This oyster, however, contains relatively few pearls, which are more numerous in the smaller Black-lip oyster (*Pinctada margaritifera*) and Shark's Bay oyster, sought solely for the gems.

What is a pearl? A pearl is really built up of layer on layer of carbonate of lime, skin on skin, similar to the layers of an onion. The part of the oyster that creates pearls is the transparent, jelly-like fluid — called the "mantle" — that lies between the body of the oyster and the shell. In the same manner as the cells at the base of the human finger-nails are driven by nature to keep on creating that peculiar, hard substance which we call finger-nail, so the cells of the "mantle" of the oyster are driven to create and deposit on the inside of the shell, in order to make it comfortable for the oyster,

the thin, slimy film of carbonate of lime, which hardens into "nacre" or mother-o'-pearl.

Although many pearls are built up by the oyster for no apparent reason, being solid pearls throughout, at least half of the gems discovered are produced as a result of the intrusion of foreign matter into the shells. A grain of sand, a bit of sponge, a tiny piece of seaweed, or some minute denizen of the sea sometimes finds its way into the shell, but as soon as it comes in contact with the cells of the "mantle," they immediately begin to coat it with slime that duly hardens into "nacre." The cells go on adding coat after coat of "nacre," until, in the course of years, a pearl is formed.

The pearl oyster also has innumerable enemies, and frequently some parasitic worm or insect attempts to burrow through the shell. In order to keep out the intruder, the cells of the "mantle" concentrate on the spot where the worm or insect is attempting to enter and build a thicker and thicker wall of "nacre" to force the creature back. When such a shell is opened there is a lump on it. This lump is called a pearl "blister." It is really only half-a-pearl, and when used in jewellery it has to be mounted so that the back cannot be seen. Often, however, these pearl "blisters" are found to contain a tiny, perfectly round pearl of great value.

Pearls differ in size according to the age of the oyster when opened, while the shape is either round, pear-shaped, or drop-shaped. The pearl is continually moving, rolling in the shell, and it is this ceaseless rolling movement which gives to it its shape. That wonderful iridescence of the pearl is caused by the light playing on the thin layers of "nacre" of which the beautiful gem is built.

A real pearl can be readily distinguished from an artificial one by testing it with the teeth. All imitation pearls are smooth to the teeth, whereas the real products of nature are gritty.

The pearling luggers of Northern Australia are two-masted vessels, about fifty feet in length, equipped with sails and engines. The crew usually consists of four divers (two dress and two native), one pump tender, one engineer, and one

cook. The pumps, which are operated by motors, have pipes leading over both sides of the boat, so that two dress divers can work at the same time. The usual style of diving dress is used, consisting of a waterproof dress, lead boots weighing about forty pounds each, and a massive metal helmet with three windows of plate glass, which screws on to a metal corselet, fitting over the diver's shoulder-blades, and to which the dress is bolted. The air enters by a pipe at the back of the helmet, and an air-valve is provided to regulate the outlet, so that when a diver wishes to ascend he has only to close this valve, when his dress inflates and he becomes lighter.

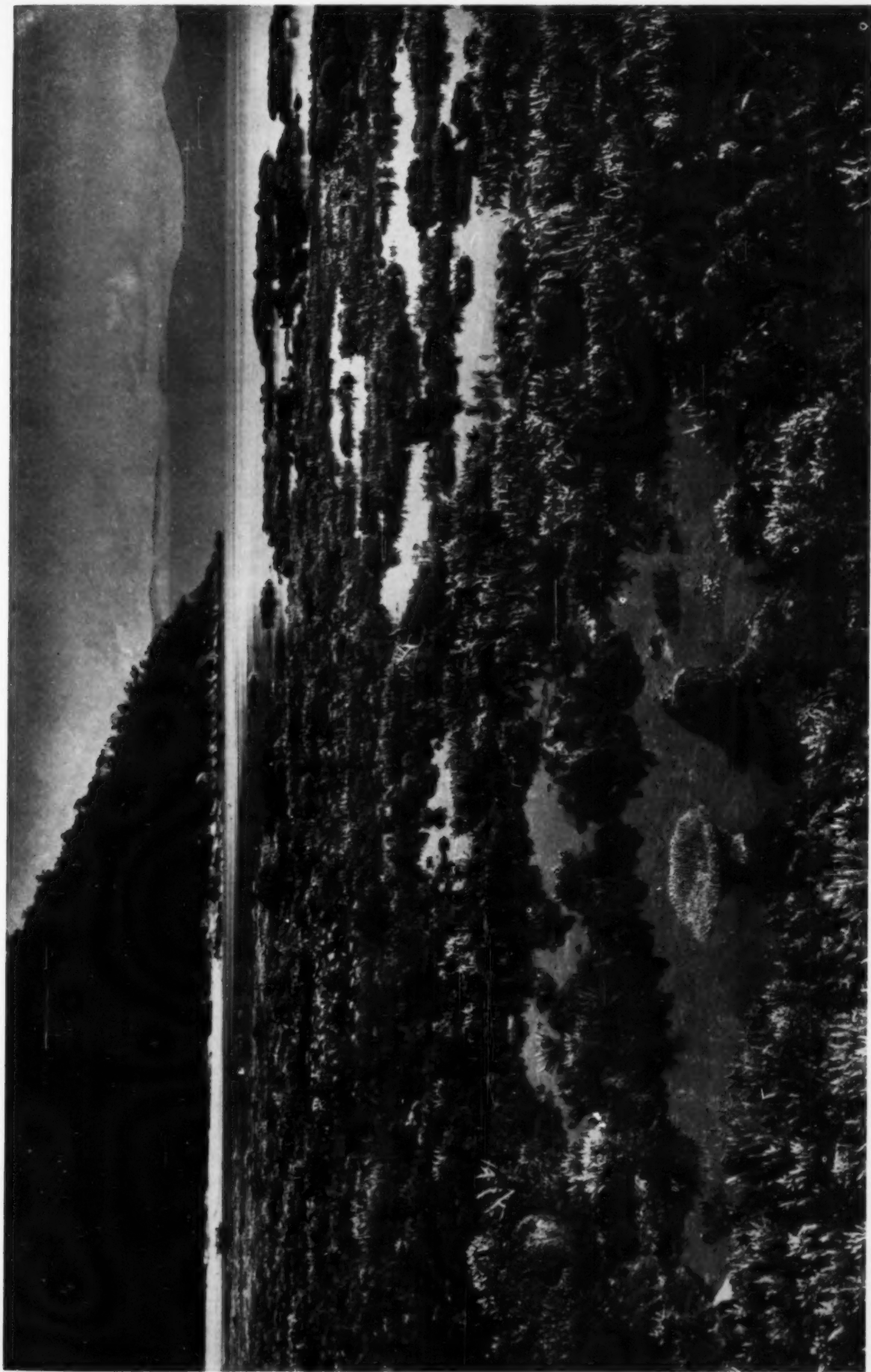
The popular idea of the pearl diver's life is that it is a languorous sort of an existence, lived under romantic conditions; but, on the contrary, the conditions are very hard. It is true that the divers work amid pleasant surroundings, for the tropical seas of Northern Australia are beautiful — beautiful beyond the power of words. These warm waters are of remarkable clearness, and in them many species of coral grow with a luxuriance unequalled anywhere else in the world. The sight of these living corals is a wonder almost beyond belief; together they make a veritable feast of colour — rose, red, sapphire blue, purple and dull gold, and every shade between. There is no "clash" in the blending of all this marvellous submarine colour scheme, and in addition there is a beauty of form which is not less entrancing. There are mushroom corals, star corals, brain corals, pancake corals, staghorn corals, and others like delicate ferns. In the shallow waters the towers and spires of the growing coral catch the stream of sunlight in rainbow hues, and scattered amongst them are clumps of strange plants and flowers — such as are never known in the sun — weird growths whose stems are living, moving tentacles. The whole scene is also enlivened by a fantastic pageant of gaily-coloured fishes of every conceivable colour and shape.

There is amazing fish life in these seas; a fact that renders the work of the pearl diver extremely hazardous, for included amongst this fish life are some terrible man-eating creatures. The divers literally

carry their lives in their hands every time they go beneath the water.

The seas off the coast of Northern Australia are teeming with sharks. Over fifty species of sharks are known to be present in these waters. The creatures range from ten feet to forty feet in length, and the majority of them are man-eaters, constituting a grave peril to the divers. A belief very common among most fiction writers is that a shark will never attack a diver in a diving dress because the upward leaping air bubbles from the diving helmet scare the monster away. This is incorrect, for hundreds of divers in Northern Australia have been attacked by sharks, and many of the men have been killed. A diver from a pearling boat on which I recently travelled had the bottom ripped clean out of his diving suit by a shark. He managed to escape and fight his way to the surface, but he was half-drowned when removed from the water. But he was more fortunate than a diver on another boat. This man was working in about ten fathoms when a huge tiger shark came straight for him, and before he could signal his companions in the boat above, the shark grasped the copper helmet in its mouth and made off with the diver. The creature was apparently unable to tear the helmet off, for it dropped its "catch" when the line was hauled on by the men in the boat, who suspected that something was wrong. But the diver was dead — his head being crushed in — when brought to the surface. The depth and the number of teeth marks in the damaged helmet were the only evidence of what had happened.

Other man-eaters which have taken a heavy toll of the divers are huge reef-eels, monsters which attain an average length of about twelve feet. They are the only man-eating eels in existence, having enormous crocodile-like jaws capable of cutting a man in two. Giant gropers, huge cod-like fish, ten feet long and a quarter of a ton in weight, are other terrors. They have a cavernous mouth armed with razor-sharp teeth, and have been known to swallow a man whole, in one gulp. Highly venomous sea-snakes and giant devil-fishes are also plentiful. The devil-fishes or giant rays are flattish, diamond-shaped creatures, which grow to an enorm-



A coral reef in the pearling grounds of Northern Australia. No picture can give any idea of the beautiful coloring and unusual shapes of the coral in these waters. But these coral areas are also a danger to the pearl divers. In the sides of these reefs, below the surface of the water, dwell man-eating fish and eels, which invariably attack the first diver they see. The most dangerous fish is the gopher—a huge cod-like fish, which attains a length of anything up to 10 ft. and a weight of a quarter of a ton.

ous size, covering many square yards of the sea-floor. When disturbed they invariably attack, and with their formidable, sharp-toothed mouth they have often fatally injured a diver. They have another weapon, too; a toothed spear in their tail. They use this with extraordinary ease and quickness, and many times the spear has almost ripped a diver to pieces. Monster octopuses are also occasionally encountered, while other enemies are the giant clams. These amazing creatures, which are like gigantic cockle shells, are the largest bivalve molluscs ever known to exist. They attain a diameter of anything up to fourteen feet. The shells are hinged in two parts like the oyster, the hinge being a strong muscle, the contractions of which are immensely powerful.

The clam spends most of its time feeding with its shells wide open. In such a position the huge, flabby creature itself is completely exposed. Despite its great size, it lives on the tiny organisms in the water. It is continually sucking in water, which, after everything of food value has been extracted, is ejected. At the least sign of danger, the clam closes its shells with a swirl, and, because of this habit, the mollusc has been responsible for numerous deaths of divers. In the dim undersea light they have fallen or stepped into a closing clam, and have either been crushed to death by the enormous shells, or have been held trapped by the leg to die a terrible, lingering death.

The native "skin-divers" are, of course, easier prey than the dress divers to these undersea monsters, and scores of natives have been killed, while others have been badly injured by the man-eaters. The belief in some quarters that dark-skinned races are immune from shark attack is definitely a fallacy so far as Northern Australia is concerned. There was one recent case in which a native was gathering pearly oysters in about five fathoms of water, when a tiger shark, fully sixteen feet long, attacked him. In its first rush the monster tore a great piece of flesh from the native's right shoulder.

The native was less than three feet from the surface when the shark caught him again, and as the monster's terrible jaws closed on the native's leg he gave up

all hope, when suddenly a dark shadow left the lugger.

It was another native diver who, upon noticing his companion's plight through the crystal-clear waters, immediately grasped a spear, and, diving overboard, drove the weapon deep into the shark's side. It was a magnificent action—that combined diving and spearing—and a brave one, for the native took his life in his hands, as it were; had he missed with his spear he would undoubtedly have fallen a victim to the man-eater as well. When speared, the monster released its victim, who was then assisted into the lugger by his rescuer. The shark rolled over and over in the water, which in its agony it lashed furiously with its tail, and then, with the spear sticking in its side, it disappeared into the depths below. The injured native was admitted to hospital suffering severely from his injuries, but he made a rapid recovery, and within a few weeks was at work diving again.

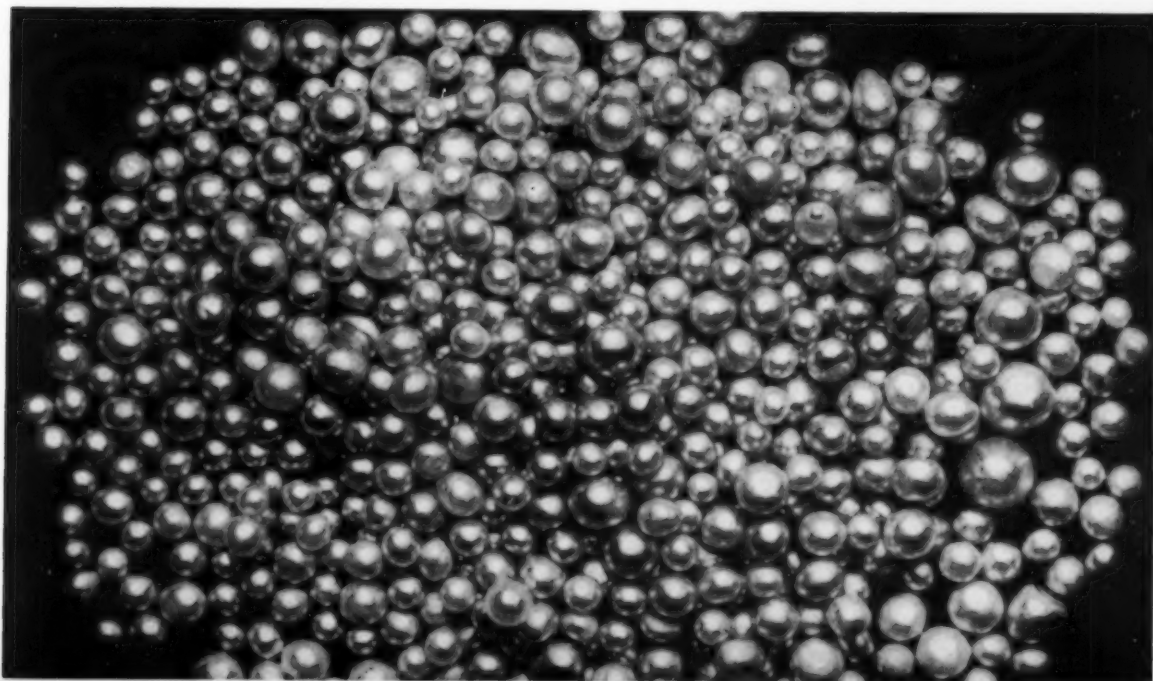
That incident—by no means an isolated one—reveals the great courage and the extraordinary diving ability of the natives, who are chiefly Torres Strait Islanders. But for their courage and swiftness in the water, more of the natives would undoubtedly fall victims to sharks and other man-eaters every year. The natives wear no diving dress at all, except for a pair of diving goggles, and they have astonishing powers of under-water endurance. Nor does an accident deter them from taking up their perilous work again. On many of the luggers are natives with a leg or an arm missing—having been torn off by a shark, groper or reef-eel—but in many cases they are as expert beneath the water as any of their fellow divers with both legs and arms.

The natives can be hired very cheaply, and while they are good workers, they are not all perfect workers, as one pearler recently found out. He had been at sea for about a month when his native divers decided that they would like to return home for a rest. They knew that it would be useless asking the pearler to return before he was ready, so they quietly arranged to compel him to return. No brute force was necessary; the pearler returned entirely of his own accord, and



A pearl diver descending in the tropical waters off the coast of Northern Australia. The diving dress is of rubber, the massive metal helmet having three glass windows. The boots are of lead and weigh about 40 lbs. each. In these dresses the divers can descend to 35 fathoms. When descending the diver throws himself backwards on the water and then sinks. The air enters the suit by a pipe at the back of the helmet, and an air-valve is provided to regulate the outlet, so that when a diver wishes to ascend he has only to close this valve, when his dress inflates and he becomes lighter.

A fine collection of real pearls, valued at more than £10,000, obtained from North Australian water



also made a record trip back to port, rushing to a doctor as soon as he landed. And this was the doctor's story: "He told me that he was suffering from a bad attack of dysentery. It looked like it, too, but I soon found out what he was really suffering from. It wasn't dysentery." Here the doctor chuckled. "No, it wasn't dysentery; the poor man was simply experiencing the uncomfortable — decidedly uncomfortable — after-effects of taking several drinks, tea probably, in which the natives had dissolved a good quantity of that harmless but very purging fluid, the juice of the milk-tree! I've treated several men for the same thing. It's an old dodge of the natives when they want to get back to port, and although it has been 'worked' scores of times, it still catches an occasional careless man who doesn't look after his food and drink properly."

Of course, once a native has "worked" a trick like this he takes great care that he does not meet the pearler again.

The greatest depth ever worked by pearl divers in Northern Australia has been about thirty-five fathoms, but it is considered that in the deeper waters, which have not yet been worked, there is vast pearl wealth waiting to be won. But it needs something more than the ordinary rubber diving dress to penetrate these depths. Just as likely, too, there are greater and more dangerous marine creatures to be encountered in these hidden deeps.

When brought to the surface by the divers, the oysters are opened and inspected for pearls. The animals are removed from the shells, which are then cleaned and dried, sorted into different grades, according to size and quality, and sold to dealers at the pearling ports. These dealers pack the shells into long boxes of stout wood and ship them to America, Great Britain and Continental Europe.

Only during the cyclone season—from November to March—are the pearlmen unable to work, for then the tropical seas are whipped frequently by fierce cyclones, which no pearling boat can withstand. During this season the boats all remain in port, but occasionally a fleet may be caught at sea, when usually a terrible holocaust results. The worst disaster of

the kind Australia has ever known occurred thirty years ago, when a fleet of seventy-seven pearling luggers was destroyed in one night, and three hundred and seven men were drowned. This tragedy was the most appalling sea disaster in Australia's history, and it was noted for the heroism of a native woman who became the first black person in the world to receive the gold medal of the Royal Humane Society. She was on a pearling boat, on which her husband was employed as a diver, and saved the lives of two white men by swimming with them, supported on her back, to the shore nearly two miles away. It was an amazing performance for a woman, as for over five hours she had to battle through mountainous seas, collapsing from exhaustion when she reached the shore.

Most of the pearlmen also collect trepang. The trepang, as it is called amongst Eastern peoples, or *bêche-de-mer* in European parlance, is a peculiar, sausage-like sea-slug, which attains a length of anything up to three feet. There are over thirty varieties found in the tropical waters of Australia, being black, brown, dark-green and red in colour. The slugs are not nice to look at. No more unattractive creatures could be imagined. Yet for centuries the sun-dried and smoked slugs have been a great delicacy in China, where elderly Chinese gentlemen have the strange belief that, by consuming soup made from the slugs, it is possible to recapture lost attributes of youth. Accordingly, they pay substantial prices for the article, and as much as £350 per ton has been received for big slugs from Northern Australia.

Natives are employed to dive for the slugs, which are easily distinguished through the clear waters against the sandy sea-floor, where they normally spend the whole of their existence. For food the slugs rely solely on the sand. They have dozens of tiny tentacles around their mouth, and when needing food they simply spread these tentacles and mop up and swallow a mass of sand on the chance that it may contain a titbit or two, all waste matter being at once passed out through the body.

After capture, the slugs are treated either on board the lugger or on a nearby

island. Each slug is first cut open and cleaned, and then boiled in sea-water for half-an-hour. After boiling, they are flattened out, and small sticks of bamboo are placed in each "fish" to keep the flesh apart. They are then placed on wooden or wire-netting trays and put out in the sun to dry. When most of the moisture has evaporated, the slugs are transferred on the trays to a "smoke-house," where they are smoked over a slow and smoky fire.

This curing takes about two days. The process turns the slugs into small, hard, flattish lumps, which look for all the world like so many pieces of badly charred beefsteak. The bamboo sticks are then removed, and a careful examination of each slug made. This is necessary, because

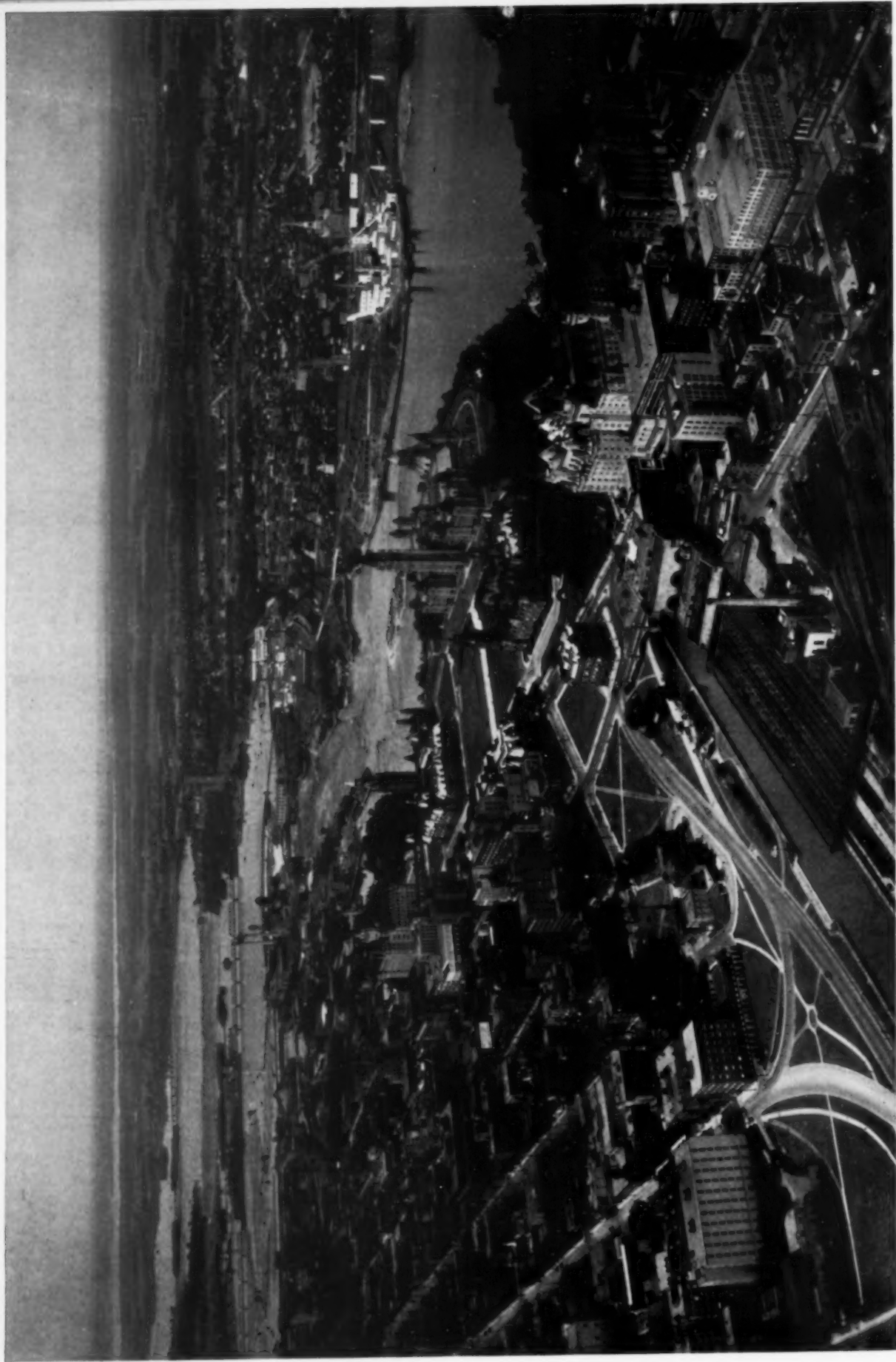
a single badly-cured slug will ruin all others with which it is packed. The slugs are then sorted into grades and packed for sale at the nearest port, from which the dealers ship them to the Orient. The work of treating the slugs is not pleasant; the smell of the curing "fish" is quite overpowering and can be detected some distance away.

The Australian trepang industry, which is operated in conjunction with pearling, owes its existence solely to the popularity of *bêche-de-mer* soup in China. The food has never proved popular among white people.

The pearling industry, with trepang fishing, has been one of the chief mainstays of Northern Australia for over fifty years, and it is likely to continue as such for many more years to come.



A pearl buyer examining gems. These buyers are, of course, experts, and almost at a glance they can tell the value of a pearl. Except in the case of exceptional gems, the price paid for the pearls depends on the weight. The delicate scales used in weighing the pearls are shown in the picture.



Ottawa, capital city of Canada, where plans were made for development of the transcontinental airway from Halifax to Vancouver. Photo by Canadian Airways, Ltd.



Lethbridge Airport, point of departure for the Crowsnest Pass through the Canadian Rockies, and north for Calgary, Edmonton and the Mackenzie River basin.

TRANS-CANADA AIRWAY

by J. FERGUS GRANT

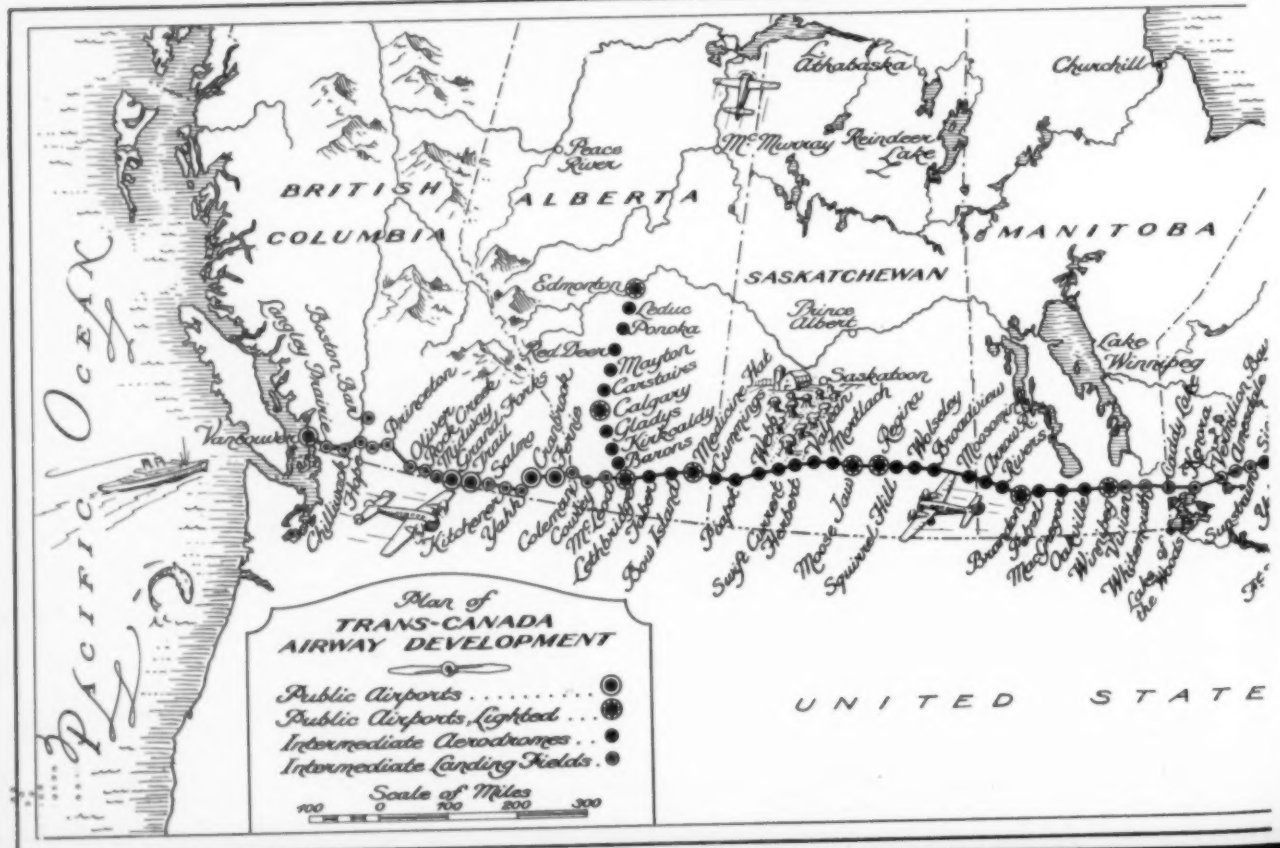
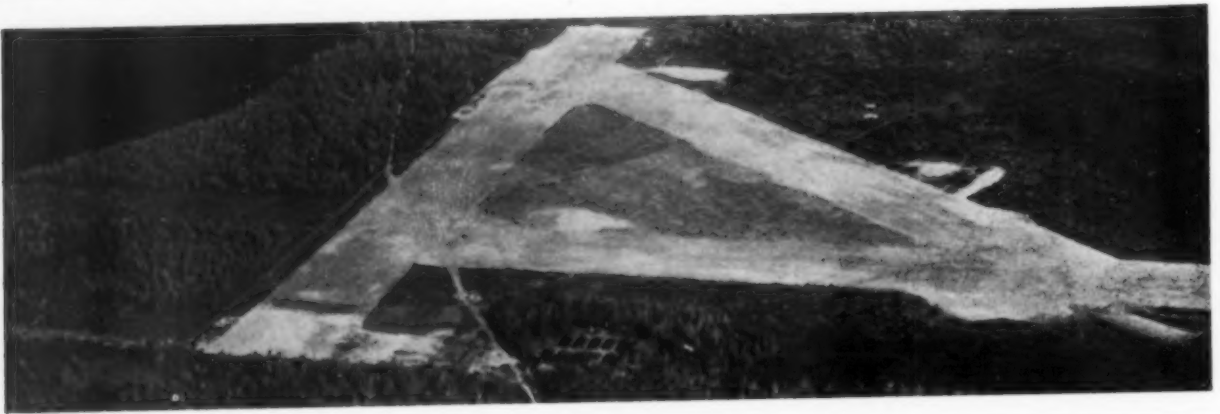
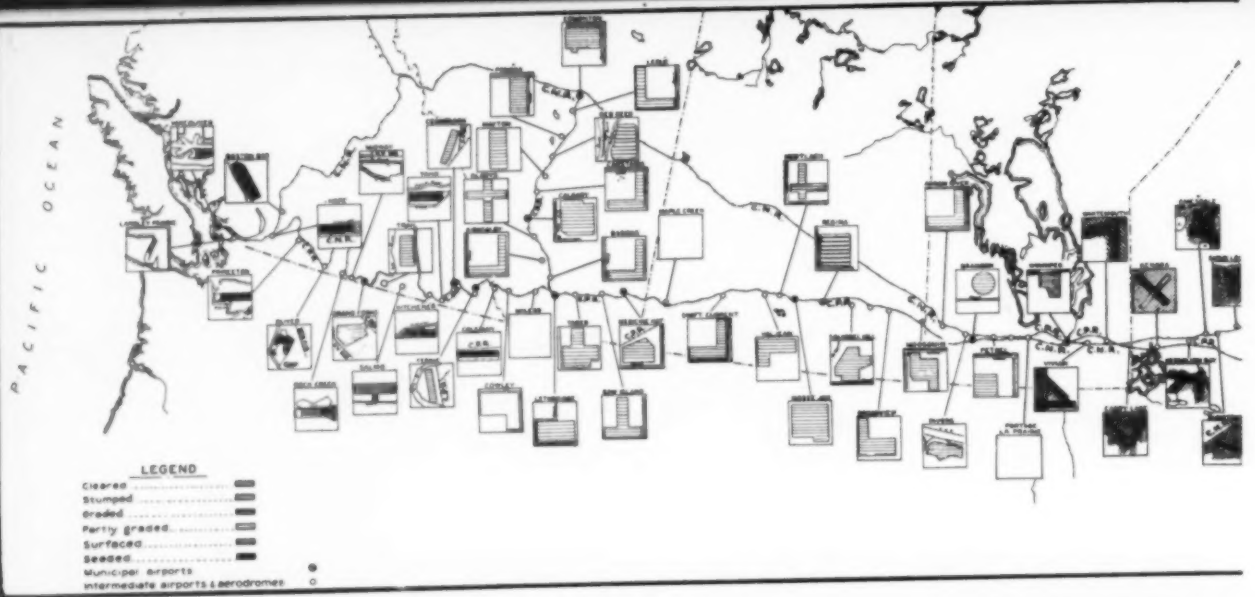
CONSTRUCTION of Canada's transcontinental airway was undertaken ten years ago. Initial plans were laid for the development of various sections in 1927, when the sum of \$75,000 was provided in the Post Office estimates by Parliament for the transportation of mails by air. Operation commenced several years later over the prairies and from Montreal to the Maritime Provinces. When the country was faced with the period, known to many as the "depression," it was decided to curtail expenditure involved in further operation of these somewhat experimental services. There were apparently more pressing demands and, as expressed to the writer by a prominent cabinet minister of the day, "with the farmers facing another bad season in the West, we cannot continue to flaunt aviation in their faces."

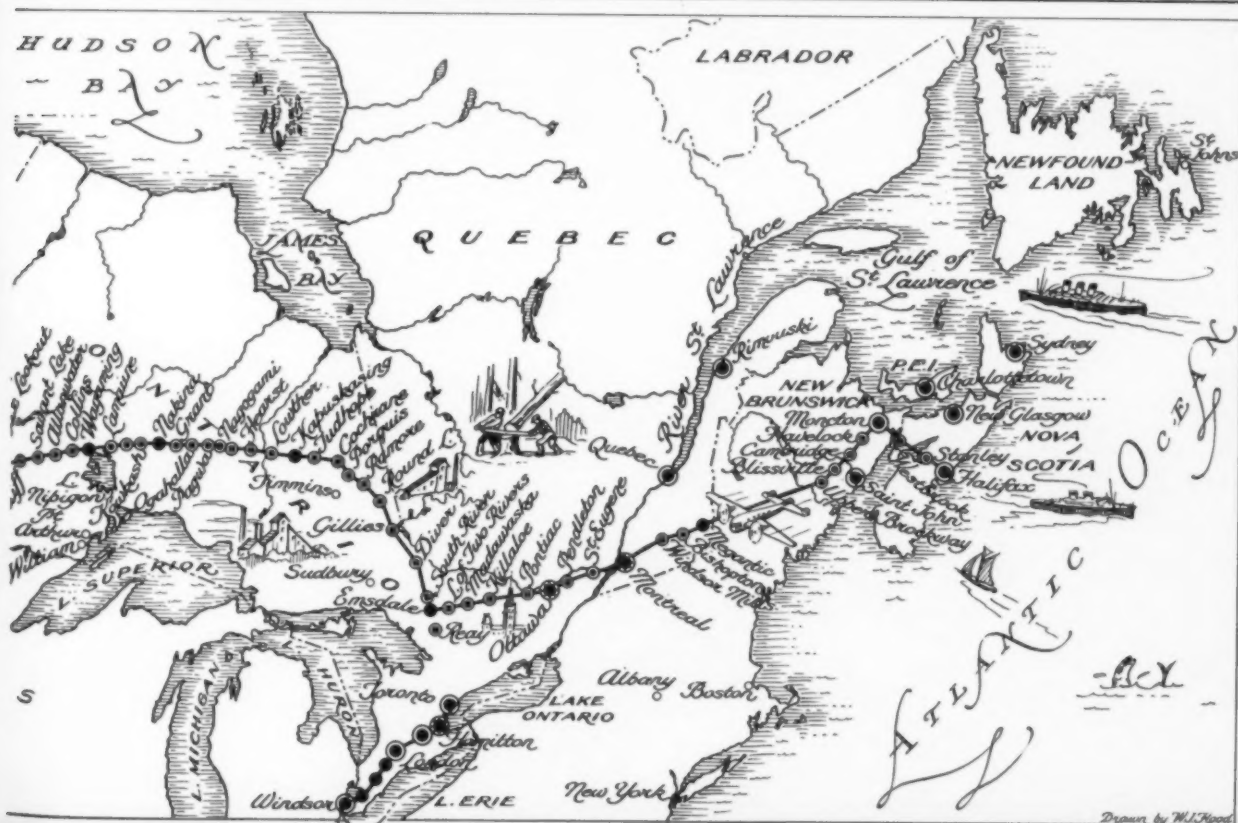
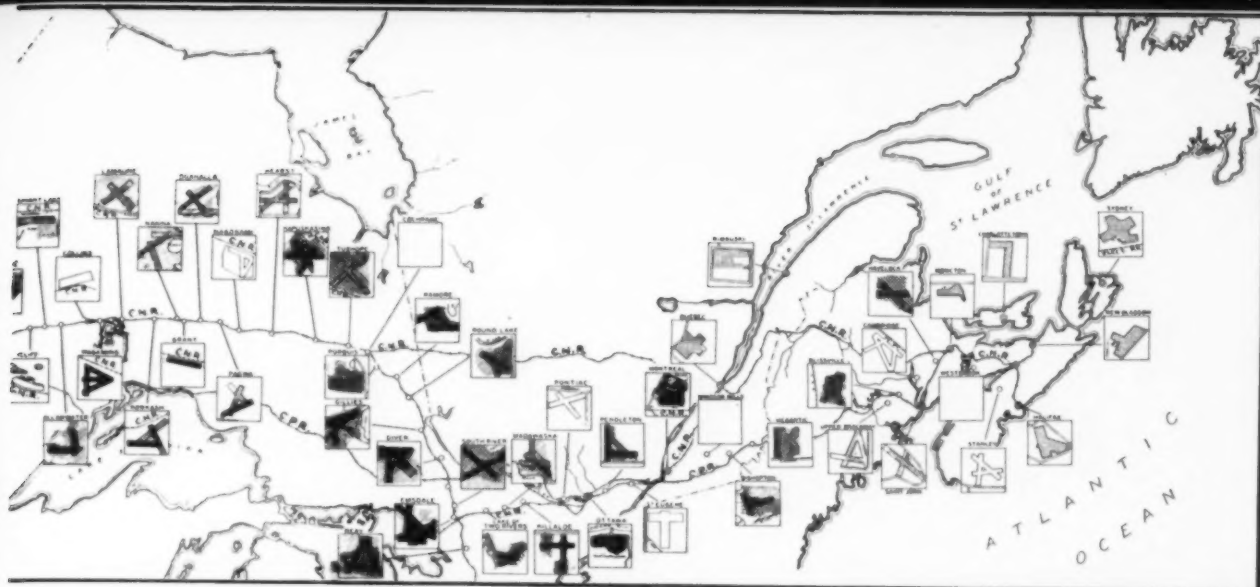
Whereas lights along the prairie route were darkened, and wireless communication between aircraft and ground stations fell silent, it was impossible to halt the fleeting steps of aeronautical development throughout the country. Services to outlying mining areas were continued, and to-day the Dominion has every reason to appreciate the confidence maintained by those pioneers who envisioned the great future of flying, its contribution towards the disclosure of vast mineral wealth and the rapid return to more prosperous conditions.

Despite reduced appropriations, surveys of the transcontinental route were continued, and, as a means whereby additional employment might be provided during the days of depression, the Government embarked on a programme of landing field development in Northern Ontario and

British Columbia, the most difficult areas in which to carve out aerodromes for aircraft, while several were created between Montreal and Halifax. The halt in actual operation on the main aerial artery was not entirely without a number of advantages, as the experience secured in Canada and other lands, the improvements in the design of new aircraft, the increased reliability of engines and advances made in the provision of radio facilities enabled this Dominion to lay the foundations of an airway that should compare with the finest throughout the world, despite somewhat rigorous climatic conditions prevailing during a part of the year. A total of 101 airports and intermediate aerodromes have been made available or are in the course of completion between Halifax and Vancouver, the approximate distance between each being thirty miles. Adequate landing facilities are thus provided for "flivver" planes of the future in addition to those engaged in the transportation of His Majesty's mails, passengers and express from coast to coast.

Besides full provision for domestic requirements, connections will be established with the vast aerial network of the United States, extending to Bermuda, the British West Indies and other islands of the Caribbean, Central and South America. Moreover, it should be remembered that Canada occupies a strategic geographical position in relation to commercial air routes of the future. By reason of her closer proximity to the North Pole, more rapid connections between Great Britain and the Orient can be secured through Canada than on any alternative course. The distance from London to Montreal







Landing field construction on the western section of the Trans-Canada Airway, indicating the character of material handled in the creation of a suitable flat surface. Top—Stumping with a team at Salmo, B.C. (1933) Centre—Removing rocks at Kitchener, B.C. (1933) Bottom—Rocks piled along one side of aerodrome at Coleman, Alta. (1936)

Photos by R.C.A.F.

along the Great Circle is only 3,386 miles, compared with 5,142 miles from London to Charleston, N.C., by way of Lisbon, the Azores and Bermuda, whereas that from Montreal to the Pacific Coast is some six hundred miles shorter than any air line out of New York. Every effort has been made to capitalize on this important factor, and the geographical advantages of this Dominion have not been forgotten in the development of a transatlantic service.

The North Atlantic trade route, now the most important, joins the great centres of industry in the old and new worlds. One is in northwestern Europe, including the British Isles, and the other lies between the basin of the Great Lakes and the St. Lawrence River and the northern Atlantic coast of the United States. This trade route is now served by the most highly efficient transport and communication systems in the world. Here, if anywhere, will be found traffic of sufficient value and density to justify the establishment of high-speed commercial air lines. The Great Circle track, or shortest route joining these two great industrial areas, passes down the Rhine Valley, through northern France and Belgium, London, northern Ireland, the Strait of Belle Isle, Montreal, the valley of the St. Lawrence and thence to the Mississippi basin. Its eastern and western terminals lie in the British Commonwealth, and from the earliest days of aviation the Canadian Government has watched its development with increasing interest. This is the route which will be extended to the Pacific by the Trans-Canada Airway, and over which it is expected a large proportion of traffic for the Orient will pass. The Great Circle course from Chicago to Shanghai extends through Winnipeg, Chipewyan, on Lake Athabaska; Simpson, at the junction of the Mackenzie and Liard Rivers; Dawson, in the Yukon Territory; Fairbanks and Nome, Alaska; across the narrow Bering Strait, and then down the coastline of Eastern Siberia, Manchuria and China. That section of the airway in North America is well known, and a large part of this route is flown in summer and winter by northern operators. Although an air service across the Pacific, from San Francisco to Honolulu and Manila, was inaugurated in 1935, the payload of aircraft is restricted by the large amount of fuel carried to traverse wide expanses of ocean. The northern, and

shorter route is thus more satisfactory, planes being enabled to refuel at economic intervals. Political conditions in the Far East militate against its development at the present time.

Finally, the creation of an efficient airway across the country should prove of material importance in its defence, should an emergency arise, enabling aircraft, personnel and equipment to be transferred rapidly from one section to another.

Development of the airway from the Atlantic to the Pacific resembles in some respects that of the Canadian Pacific and Canadian National Railways, both of which are financially interested in Canadian Airways, Limited, as many problems had to be solved and difficulties overcome. But, the route finally selected parallels one or other of the twin lengths of steel traversing the continent, material assistance thereby being rendered to those concerned with the creation of this new aerial link between the Atlantic and Pacific by the older transportation systems.

Although much might be written about the operation of the Trans-Canada Airway, the establishment of radio beacons, the installation of wireless and lighting facilities, and the provision of meteorological information for pilots, this article will be confined to the various stages in its actual development, and to the creation under difficult conditions of aerodromes along its course. While an attempt will be made to incorporate certain episodes of drama and comedy that characterized some phases of survey and construction, space limitations permit only the discussion of salient features at this time.

Foundations for the progress of aviation in Canada were laid twenty-eight years ago this month, J. A. D. McCurdy having flown an aeroplane for half-a-mile above the ice-covered surface of the Bras d'Or Lakes at Baddeck, Nova Scotia, on February 23, 1909. The machine was designed by a small group of enthusiasts, headed by Dr. Alexander Graham Bell, the Scottish immigrant inventor of the telephone and phonograph, and its flight is recognized as the first to be made in the British Empire. Following the creation of an Air Board in June, 1919, and its reorganization the following year, a flight was undertaken from Halifax to Vancouver in 1920 to investigate the possibilities of a transcontinental airway, to encourage recruiting for the C. A. F., then in its initial

stages of development, and to stimulate public interest in aviation. Although the flight was made under the most adverse weather conditions, it was safely accomplished on October 17, ten days after departure had been taken from Halifax, and the total flying time was 49 hours 7 minutes. It is worthy of note that two of the most difficult sections of the route—between Fredericton and Rivière-du-Loup, and from Kenora to Winnipeg—were flown in the dark without any assistance from a friendly moon. The experience secured on this flight proved that a regular service could be maintained between Halifax and Vancouver, provided adequate ground organization and suitable machines were available. Forty hours was the estimate for a westward flight, on which prevailing winds would delay the passage, whereas that in the opposite direction would be shortened.

The first serious endeavour to provide a regular air service for the carriage of passengers, mails and express was made in 1924 by the Laurentide Air Services, Ltd., which operated aircraft from Haileybury, Ontario, to the Rouyn gold fields. Although the importance of aerial transport was appreciated, it was maintained that the establishment of any organized system would involve large capital expenditure and heavy operating charges, which could not be justified by financial returns. It was decided, therefore, that Canada should concentrate on those services for which there was a definite demand, such as forestry patrols, aerial surveys and transportation to remote areas, no attempt being made to duplicate the efforts of countries in which physical conditions and larger populations made possible the development of air routes on an economic basis.

With the close of 1926 there ended a distinct phase in the development of civil aviation in Canada. More than 125,000 square miles of forest territory were surveyed in little over five years (481,000 square miles to the end of 1936), and 165,000,000 acres of timber land placed under aerial protection. In July, 1927, four inter-dependent administrative divisions were formed, the control of all military air activities being vested in the Director of the Royal Canadian Air Force, while the administration of operations undertaken by state aircraft, other than those of a military character, was placed in charge of the Director of Civil Govern-

ment Air Operations. An aeronautical engineering department was formed to act in a consulting capacity on technical and engineering matters pertaining to air services, and a Controller of Civil Aviation was appointed to administer air regulations and to supervise flying operations by commercial interests. It was in the same year that the initial grant was provided by the Government for the carriage of mails by air. The use of special air mail "stickers" by certain contractors was previously permitted, such as those operating between Haileybury, Ontario, and Rouyn, Quebec; Sioux Lookout and Red Lake, Ontario; Whitehorse and Keno, Yukon Territory; Carcross, Yukon Territory, and Atlin, British Columbia. The success attending such operations, and the regularity with which mails were carried under difficult conditions, with no assistance or subsidy from the Government, influenced the establishment of air mail services, the first being inaugurated on November 30 between Leamington and Pelee Island, Ontario, the most southerly tip of Canada, followed by one from Murray Bay to Seven Islands and Anticosti Island, another from Moncton to the Magdalen Islands, all in the Gulf of St. Lawrence, and a fourth between Rolling Portage and the Red Lake region, northeast of Winnipeg.

Experimental flights were made during the early part of 1928 between Winnipeg, Calgary and Edmonton to establish the practicability of an air mail service across the prairies, but weather conditions were so unusually bad, fog and heavy snow storms involving forced landings at various points, that only three trips were possible. It was proved conclusively, however, that night flying was essential to provide good connections, and the establishment of lighting facilities was considered. A preliminary survey by air was undertaken between Ottawa and Winnipeg in an effort to secure information assisting in the selection of the most feasible route, and it was indicated that the nature of the country afforded few sites for aerodromes, the terrain being heavily timbered or of rock formation. Lakes abound, however, and the survey showed there were good landing facilities for seaplanes.

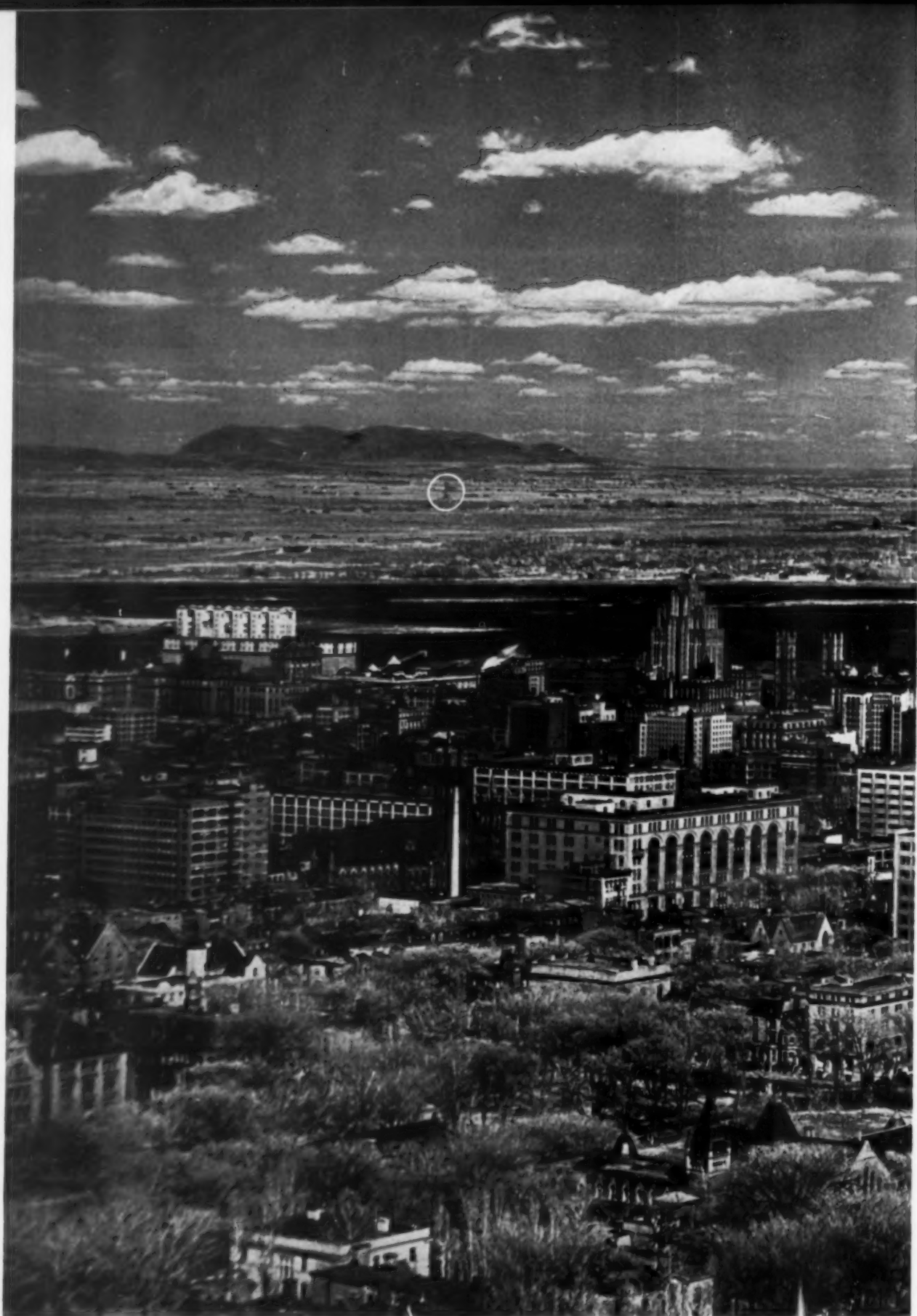
According to a report prepared at that time, conditions between summer and winter vary so much that the problem of operating a transcontinental air mail serv-



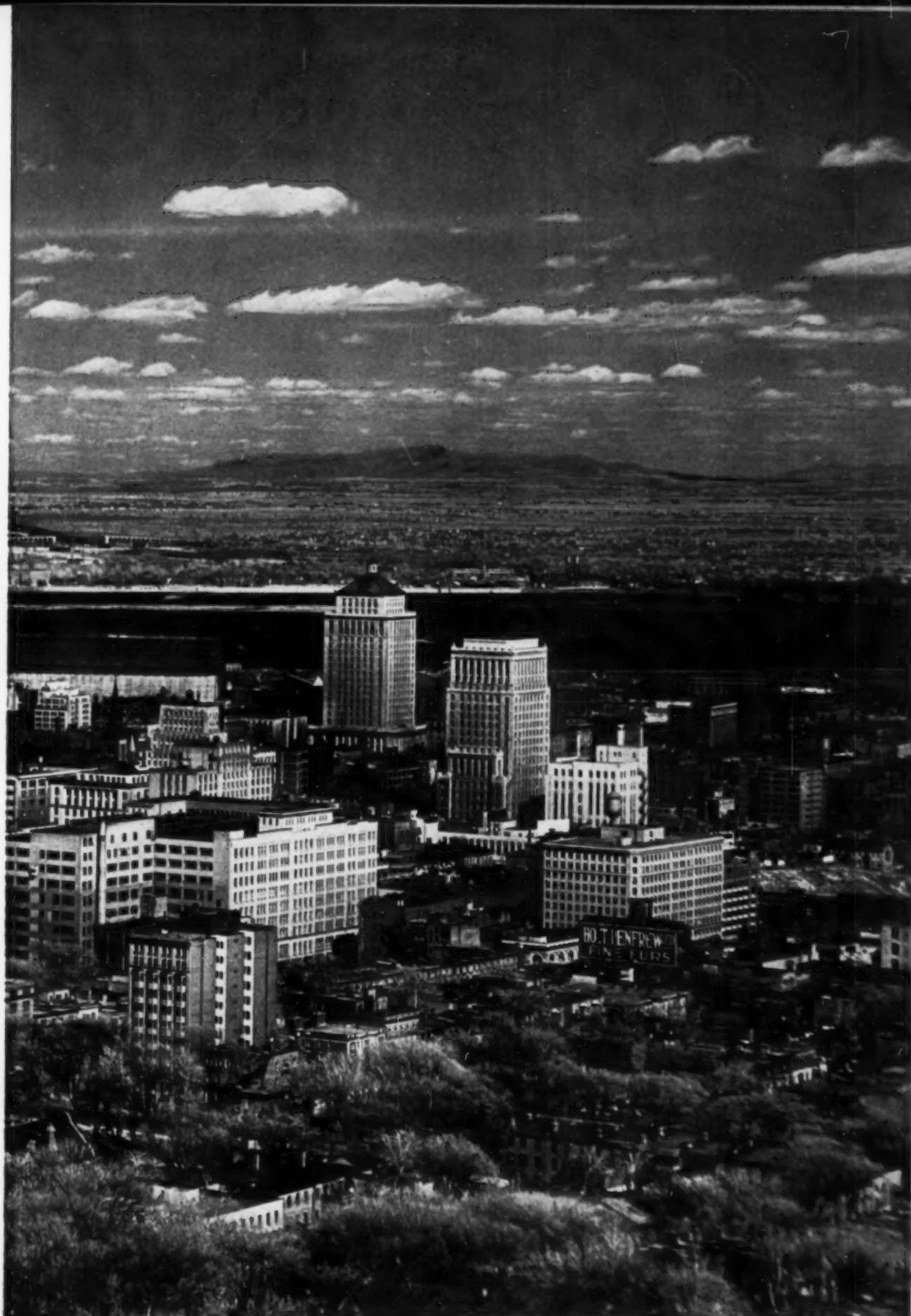
Character of country in various sections of Ontario where intermediate landing fields have been created along the transcontinental airway route. ABOVE:—Watercourse at Pendleton that had to be diverted. (1936). RIGHT:—Burning brush cleared from site at Wagaming (1933). BELOW:—Road construction through muskeg at Diver (1933).

Photos by R.C.A.F.





Infra red photograph of Montreal, taken by S. J. Hayward from the summit of Mount Royal. The white New York, Bermuda, the West Indies, Central and South America. Terminal facilities were here provided the "R-100" sailed away on August 13, 1930. The airport is recognized as the



circle on left page indicates the location of airship mooring mast at St. Hubert Airport, point of departure for a lighter-than-air service between Great Britain and Canada, but the special equipment has lain idle since finest in this country, and the equal of many of the foremost in the United States.



Photo by Canadian Airways, Ltd.

St. Hubert Airport, Montreal, indicating airship mooring mast, customs and immigration building, hangars, planes and the crowd assembled for an air pageant organized in 1932 by the Montreal Light Aeroplane Club. Kenora district, base of operations for a survey of the territory east from the Manitoba-Ontario boundary suitable for the establishment of aerodromes. Even here a site for an iniermediate landing field was found.

Photo by R.C.A.F.



ice on schedule throughout the year involved many difficulties that would necessitate the passage of some years for its development. Fog, the greatest foe of airmen, is prevalent on both coasts, but weather conditions in the interior, notwithstanding occasional blizzards and snow storms in winter, were considered favourable for operations. In Eastern Canada, as far as the Manitoba-Ontario boundary, a seaplane could be used with advantage, if summer operations only were involved, and in winter the surfaces of lakes make satisfactory ski landings possible. This did not offer a complete solution, however, as the service would be interrupted during the freeze-up and thaw-out periods. After careful consideration, it was decided that the establishment of a regular service would require the provision of aerodromes at convenient intervals from coast to coast. This would present no difficulty in the Prairie Provinces, nor in the settled parts of Eastern Canada, but in Northern Ontario, between North Bay and the Manitoba boundary, this plan would certainly involve careful surveys of the terrain and considerable expense in the construction of aerodromes. In the mountain section, it was maintained that sufficient landing fields could be created without difficulty. The problem was further accentuated by reason of the climatic conditions prevailing between the main divisional points, some of the landing fields being covered with snow for three months of the year while others are bare.

Nevertheless, it was decided to continue with the development of a Trans-Canada Airway, due in part to the public interest and support displayed. Municipalities in different parts of the country contributed more than \$4,000,000 towards the provision of adequate aerodromes, hangars and night landing facilities, where necessary. Progress otherwise must necessarily have been retarded.

Air mail services were extended rapidly in 1930, and the transprairie route between Winnipeg and Calgary was equipped for night flying. It was inaugurated early in March, Canadian Airways, Limited, having been awarded the contract. Although this service was suspended two years later, valuable experience was secured by operators and pilots, some of whom have been enabled to take courses in blind flying, and to familiarize themselves with the most recent developments in aerial

navigation. Surveys were completed of projected extensions through southern British Columbia to Vancouver, Squadron-Leader J. H. Tudhope, M.C., having been awarded the "Trans-Canada Trophy" for his remarkable efforts in selecting landing fields and aerodromes in the western province, which involved over nine thousand miles of flying under a wide variety of weather conditions. This handsome trophy is awarded annually for meritorious service in the advancement of aviation in Canada, having been presented by J. Dalzell McKee, who made the first seaplane flight across Canada in 1926, but was killed in a flying accident the following year. The route through the Rockies by way of the Crowsnest Pass and Grand Forks was found to be the shortest and safest, so it was decided to include Lethbridge on the transprairie schedule. It also serves a more densely populated area, in which landing facilities at several places had already been provided. Aerodromes have subsequently been created northwards to Calgary and Edmonton, in order that those cities might be served as satisfactorily as though they were on the main route.

Some slight delay was experienced in the establishment of a transcontinental air route, as the Supreme Court of Canada rendered judgment in October, 1930, that the Provinces were primarily responsible for the administration of aviation, though certain powers lay with the Federal Government. This decision was reversed by the Privy Council which held that the responsibility rested with the central administration of this country. This opinion was based upon a wider interpretation of the International Convention for Air Navigation of 1920, to which Canada was a signatory. Surveys and extensions continued until, in the early part of 1931, a regular service was inaugurated between Moncton and Calgary, mails from Montreal and Toronto being flown to Detroit, where a connection was made with the United States air mail service. Thence they continued via Chicago, St. Paul-Minneapolis and Fargo, North Dakota, to Pembina, on the international boundary, where they were transferred to a plane of Canadian registry, and connected with the transprairie airway at Winnipeg. Air service estimates having been drastically curtailed in 1931, the service between Moncton and Montreal was cancelled in June, while that



Constructional operations on aerodrome sites along the Trans-Canada Airway. Top—Amsdale, Ontario, where slash and stumps had to be removed before grading commenced. (1933) Centre—Excavating and hauling away boulders at Yahk, B.C. (1935) Bottom—Caterpillar tractor used in clearing site of landing field at Salmo, B.C. (1934).

Photos by R.C.A.F.



Various phases of aerodrome construction along trans-continental air route. Top—Dining hall and store houses for men working on project at Sunstrum, Ontario (1933). Centre—Fire wood secured from site of landing field cleared at Hope, B.C. (1933). Sample of timber removed from site of aerodrome at Kitchener, B.C., and used for fuel (1933).

Photos by R.C.A.F.

from Montreal to Toronto was discontinued in August. During the year there were 470,461 pounds of mail, or approximately nineteen million letters, carried by air under Post Office contracts, and the total route mileage on January 1st of that year was 6,436, of which 1,350 miles were lighted. The scheduled mileage was 1,488,177, and the distance actually flown was 1,412,444 miles, the services being interrupted on occasion by bad weather conditions and forced landings. An operating efficiency of 88.5 per cent was maintained.

An indication of the efficiency maintained six years ago on that section of the Trans-Canada Airway then in operation, together with an impression of the prairie route, is contained in a telegraphic despatch from the author of this article to the Montreal Gazette, following the inauguration of a service from the Canadian metropolis to Calgary, and an overnight flight from Winnipeg. Dated February 4, 1931, the article reads in part: "Air mail posted in Montreal last Monday, in time to catch the plane leaving there at 9.15 that morning, arrived here at 5 a.m. to-day (Wednesday), and made the first city delivery. That for points farther west was put aboard a train leaving at 8.15 a.m., due in Vancouver tomorrow morning at nine o'clock, in time to catch the second city delivery.

"Mail transportation from Montreal to Calgary in two days, and to Vancouver in three, is now a practical proposition, as proved by the completion here this morning of the initial commercial flight from Canada's metropolis over established air lines. Your correspondent stepped to the dusty surface of the local aerodrome from a warm cabin plane, which brought him and a large consignment of mail from Winnipeg in ten and a half hours. It was the final stage of the first passenger flight from Montreal over the aerial route placed in operation with the inauguration yesterday of a service between St. Paul, Minn., and Winnipeg. The whole distance of 2,525 miles, via Toronto, Detroit, Chicago, St. Paul, Winnipeg and Regina, was covered in approximately thirty-one flying hours, from which it should be possible to cut three hours under more favourable weather conditions. The rail distance from Montreal to Calgary direct is 2,244 miles, covered in 72 hours.

"Considerable credit is due the officials responsible for the development of this night route, which enables a business man at one extremity to visit the other without being absent more than two nights and a day. Revolving and stationary beacons guide pilots along their course, and the emergency landing fields are outlined with smaller lights. Aerodromes along the route are good, and these are situated within one or two miles of the centre of each city. Around them should grow up large communities, and eventually the airports will be the focal points in every town.

"One hundred miles from Calgary, the southwestern horizon was seen to present a ruddy glow, which had every appearance of a tropical sunrise. This was occasioned by burning gas in the Turner Valley oil-fields. Later, tall columns of flame were outlined against the foothills of the Rockies. A visit to the prairies is well worth while, if for no other reason than to fly across the vast wheat fields of the world's granary with the night mail. It is an experience, under favourable weather conditions, that will long be remembered."

Northern Ontario presented the most difficult problems in the selection of aerodromes by reason of the rugged character of that country, but this final link in the aerial chain had to be forged in order that an airway through Canadian territory might be established. Squadron-Leader Tudhope, whose experience in British Columbia should serve him well in this region, set forth in June, 1932, with Major R. Dodds, M.C. Flying a Fairchild "51," and provided with full bush equipment, including a collapsible boat, they surveyed the terrain on either side of the two railway lines connecting Ottawa with the Manitoba boundary. After passing low over some likely site for an aerodrome, the fliers would descend on the nearest lake and reconnoitre the area on foot. The prevalence of mosquitoes and black flies made their task almost impossible, and delays were involved when assistance was rendered in fighting forest fires then raging.

Considerable care was exercised in the operation of this seaplane, and little trouble experienced. There was an amusing sequel to a forced landing near Bremner, when it was found necessary to sit on the pontoons and paddle the machine a distance of five miles down the White River, which would like a snake through spruce swamps and several lakes. Facilities for lifting the



Caretaker's cottage at Reay, Ontario, similar in design to others being erected on intermediate landing fields along the Trans-Canada Airway.

Hangar at Kapuskasing, Ontario, and typical of others being built along the transcontinental air route.





engine and effecting its replacement were available at a mill, but a new motor had to be secured from Ottawa. The nearest centre from which to send a telegram was White River, notorious as the coldest spot in Canada in winter, some distance "down the line," so Dodds "flagged" a freight train passing at a late hour. Coming round a bend, its headlight suddenly illuminated or cast into relief what, in the opinion of the engineer, appeared to be a gruesome spectre, Dodds having been partially encased in a large net as a means of protection from the myriads of mosquitoes and black flies. Instead of stopping, the engineer put on speed and rushed past the derelict airman.

Having subsequently secured transportation from a track inspector, Dodds reached White River, dispatched his telegram and then wandered into the Y.M.C.A., where he happened to overhear the engineer of the train that had passed him discoursing on his strange experience in a desolate section of bush. He claimed in all sincerity that he had seen a real ghost on the track, and . . . "You never expected that the ghost would rise to confront you at a later date," interrupted Dodds. "I am that ghost," he continued, thereafter explaining the situation, much to the merriment of the assembled gathering.

Thirty-six hours after the telegram was sent, a new engine was received in this isolated section of Northern Ontario, and in another eight hours it had been installed. Further investigations were carried out, landings effected on various lakes and inspections of possible sites made on foot, and the initial part of this difficult task completed in August. Following an urgent suggestion that the transcontinental airway should extend from Toronto through to Winnipeg, an examination of the terrain between Parry Sound and Sudbury was made, but the rocky character of the region prevented the construction of intermediate landing fields. The north shore of Lake Superior was also found to be very rugged, though good aerodromes might be created at a number of places. But, the prevalence of fog alongside the lake during summer and winter months rendered selection of that route inadvisable.

Good landing facilities were obtainable along the route of the Canadian National Transcontinental, following the height of land. An elevation plan of the territory indicated relatively little difference in

altitude between Cochrane and Sioux Lookout, the average height being 700 feet, whereas that on the C.P.R. varied between 700 and 1400 feet. It was proposed to establish aerodromes at intervals of between 25 and 30 miles, and this was accomplished with one or two exceptions, where the intervening distance was increased to thirty-five miles.

When, towards the end of 1932, it was decided to create unemployment relief camps throughout the Dominion, Tudhope and Dodds were sent out again in October with survey parties to establish accurately the location of sites tentatively selected for aerodromes along the Trans-Canada Airway. Although it was unusual to organize groups of surveyors during the late autumn and winter months, when rigorous conditions would be experienced and accommodation limited to tents and sleeping bags, the boundaries were set up and rights secured to property, most of which was crown land. However, late in December, deep snow encountered in the vicinity of Vermilion Bay prevented further progress being made with any degree of satisfaction.

Camps were established at Gillies and Nakina during the early part of 1933, followed by others at selected sites along the transcontinental air route, bush being cleared over wide areas, stumps and roots removed (grubbing), grading operations undertaken with manual and mechanical aid, and subsequently the areas were surfaced and some have been seeded. Aerodrome sites were selected between Ottawa and Emsdale during the spring of 1933, and several south from Emsdale to Toronto. But, as the Queen City has not yet decided on the location of a municipal airport, to be followed by the installation of a radio beacon, it has not been possible to complete the southern section of this important branch of the Trans-Canada Airway.

Good progress has been made in the construction of aerodromes during the last three years, both in the Maritimes and in British Columbia. Including three in Southwestern Ontario, and excluding five suitable sites selected in the State of Maine, there are at present 101 airports and intermediate landing fields on the route of the Trans-Canada Airway. The section between Montreal and Kapuskasing is in good condition, aircraft being enabled to land safely at all aerodromes with the



Airport at Moncton, New Brunswick, point of departure for Charlottetown, Prince Edward Island, indicating character of country, and crowd assembled for a Maritime Air Pageant.

Moosejaw, indicating character of level, prairie farm land beyond the outskirts of the city, over which passes the Trans-Canada Airway. (Courtesy of Bureau of Geology and Topography) Photos by R.C.A.F.



exception of Round Lake and Tudhope. Until the middle of last summer, it was possible for an aeroplane to descend only at Wagaming, between Kapuskasing and Winnipeg, but much progress has since been made. Although landings may be effected at many of the fields without difficulty, pilots are advised that they do so at their own risk. The transcontinental route is completed between Winnipeg and Lethbridge, and the British Columbia section may be used safely with the exception of the aerodromes at Langley Prairie and Midway.

Canada leads the world in the quantity of freight and express carried by air, while other remarkable advances have been achieved during the past decade, progress from the teething stage being indicated in some measure by the following figures:

	1925	1935
Freight (pounds).....	592,220	26,439,224
Mail (pounds).....	1,080	1,126,084
Letters (number).....	43,200	45,043,360
Aircraft flights.....	3,171	153,211
Aircraft hours.....	4,091	88,451
Aircraft mileage.....	255,826	7,522,102
Passengers.....	4,897	177,472
Licensed aerodromes.....	34	96
Licensed aircraft.....	39	380
Commercial pilots.....	18	414
Private pilots.....	18	496
Air engineers.....	55	472
Air mechanics.....	32	318

More than ten years ago there appeared a report on the development of aviation in this country, suitable reference to which may now be made in conclusion, as the tribute then paid to the energy and devotion of flying and ground personnel is still applicable. "The good service record created by Canadians in the Air Force during the War has been fully maintained in peace, and no country has been better served by its aviation personnel. Much of the work is carried out under difficult conditions, from remote bases, without adequate facilities, with small staffs and often obsolescent types of aircraft. The spirit of all engaged in the work has been wonderfully fine. A new generation of young pilots and mechanics is now under training, and they have before them a fine example in the courage, energy and initiative of the war-trained men. A great future awaits them. The air flows over land and sea; more than either land or sea is it the place of vision, of speed and freedom of movement. What we of this generation are witnessing is a process whereby the air shall come into its own. It will become a great highway for the traffic of peace."



Lockheed Electra monoplane used for radio beam experiments through the Rockies, on airport at Lethbridge, showing typical boundary light and beacon.



Twin-engined Lockheed Electra, operated on a daily service between Vancouver and Seattle by Canadian Airways, Limited, and a sister-ship of the machine purchased by the same company for radio beam experiments in the Rockies (below). Aircraft of this character are in regular operation throughout the United States, carrying passengers, mail and express.





Rocky Mountains in vicinity of Crowsnest Pass, the route by which the Trans-Canada Airway extends from Lethbridge to Vancouver.

Photo by Hydrographic Survey and Map Service



Aerial view of territory in Northwestern Ontario, where it was necessary to select a number of sites for emergency landing fields, indicating that at Ycliff (centre) during an early stage of clearing operations.

Photo by R.C.A.F.



Intermediate aerodrome at Amesdale, Ontario, indicating nature of country in which it was necessary to create landing fields that would meet requirements of the airway connecting Halifax with Vancouver.

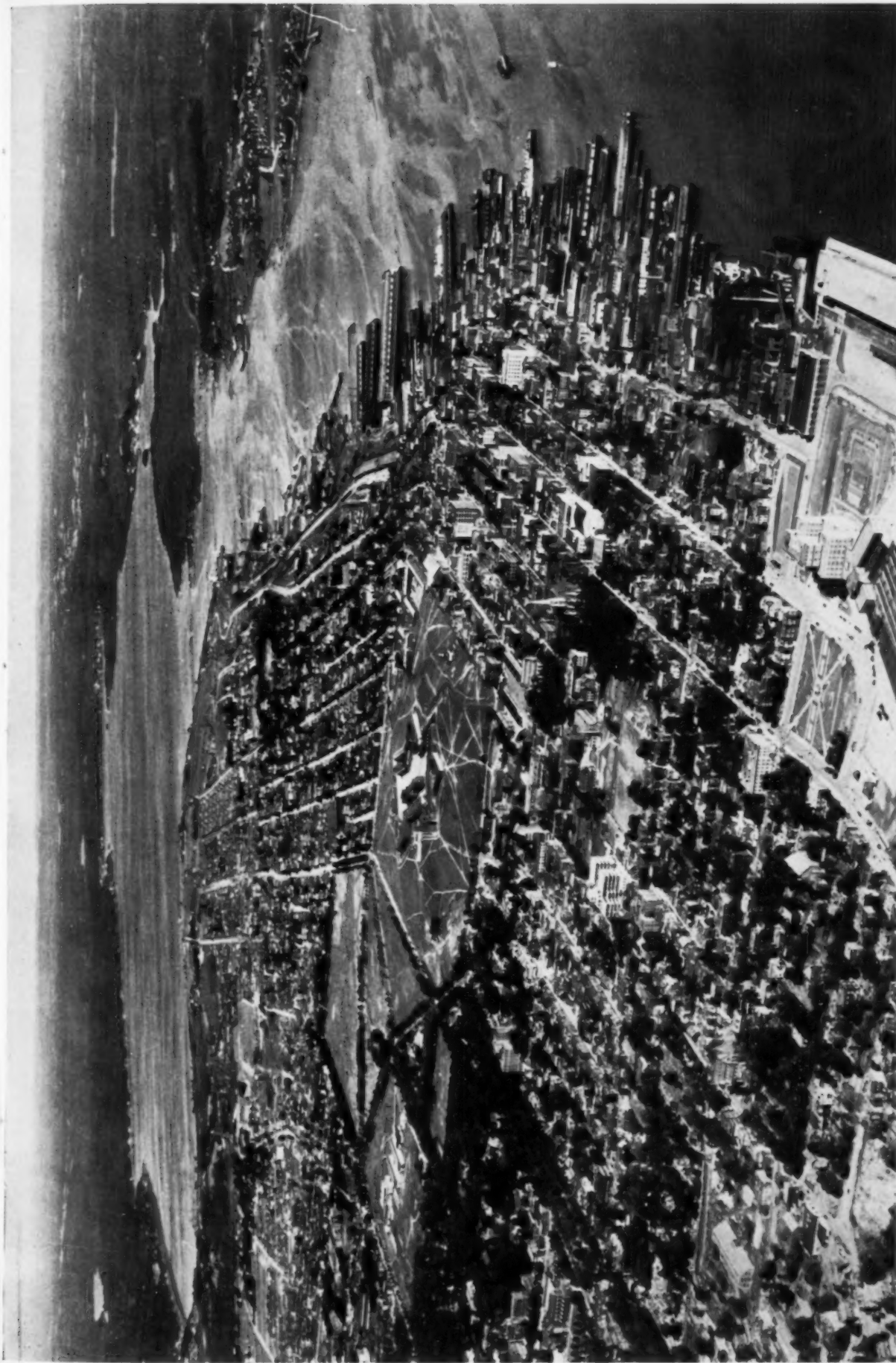
Photo by R.C.A.F.



Vertical view of large lake at Nakina, Ontario, which had to be drained in order that an intermediate aerodrome might be created, no other suitable site in the vicinity being available.

Photo by R.C.A.F.

Vertical view of large lake at Nakina, Ontario, which had to be drained in order that an intermediate aerodrome might be created, no other suitable site in the vicinity being available.



*Aerial view of Halifax, eastern terminus of the Trans-Canada Airway, showing the citadel (centre) and ore end of the large ocean dock (bottom right).
(Courtesy Bureau of Geology and Topography)*

Photo by R.C.A.F.



"E.P." Ranch, property of H.R.H. the Duke of Windsor, in the foothills of the Rockies.

Sydney, Nova Scotia, at one time suggested as the Canadian terminus of the transatlantic air line from Great Britain and Ireland. (Courtesy Bureau of Geology and Topography)

Photos by R.C.A.F.



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EDITOR'S NOTE BOOK

Mr. J. Fergus Grant, who contributes a comprehensive article on the "Trans-Canada Airway" in this issue, represents the Canadian Geographical Journal in Quebec Province. As aviation and marine correspondent of the Montreal Gazette for eleven years, Mr. Grant travelled extensively throughout the world, and is familiar with the development of aviation in this country during that period. He has flown over various sections of the transcontinental system in planes of Canadian Airways, Limited, when that company was flying the mails, and accompanied the first consignment of letters sent by air from Eastern Canada to Calgary, when a service was inaugurated via Toronto, Detroit, Chicago, St. Paul-Minneapolis, Pembina and Winnipeg. Mr. Grant also flew the Atlantic in H.M. Airship R-100, crossing from Montreal to Cardington (near London) in 57 hours in August 1930, representing both The Gazette and The New York Times on that flight. He has written articles on aviation for various publications, including The Round Table, well-known English quarterly.

Considerable interest in the Canadian Geographical Journal is now being displayed by schools and other educational organizations throughout the country, as the fine pictorial presentation of facts pertaining to this Dominion and other lands is more fully appreciated since the character of the Journal was changed last May. Photographs stimulate the imagination, and provide a clearer educational conception of certain subjects than many other methods of instruction. Support of this contention is found in an illustrated edition of "Northland Songs", prepared by John Murray Gibbon. Sixteen themes of a typically Canadian character have been presented with a number of beautiful descriptive photographs. As explained by Mr. Murray Gibbon, fine old melodies brought to North America by settlers from the British Isles and Continental Europe have been selected. In some cases the words to which they were sung have been forgotten, and in others the original words are in a language with which the majority of Canadians are unfamiliar. In writing new words to old tunes he has followed the example set by Robert Burns, Tom Moore and many other song writers, keeping to the spirit of the music and writing words which are easy to sing.

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